

FIG. 1A

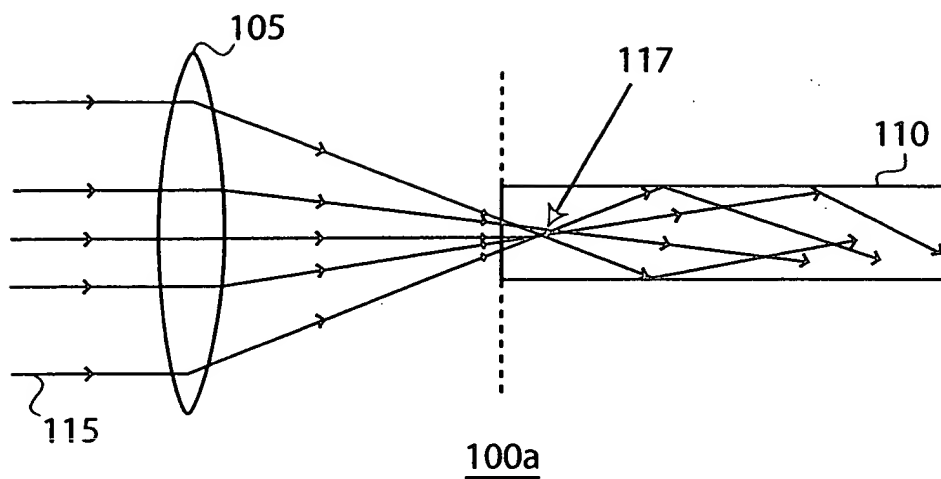


FIG. 1A

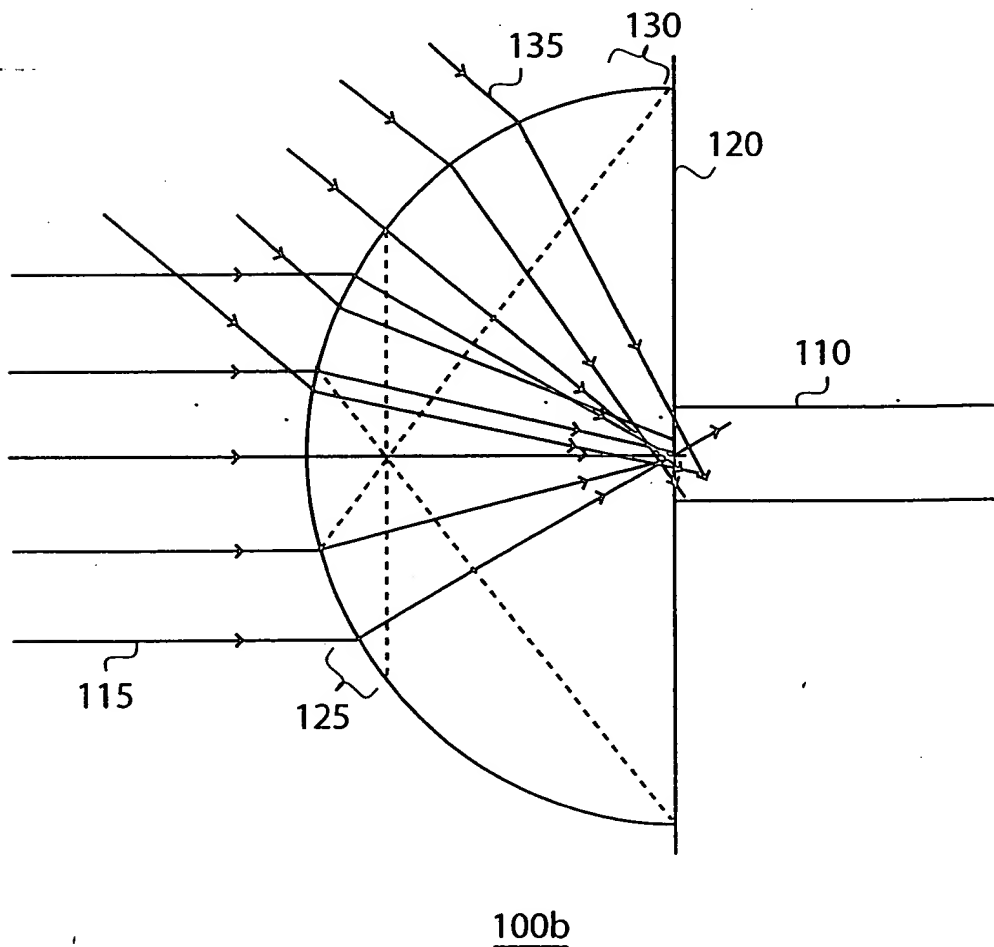


FIG. 1B

[illegible]

FIG. 2A

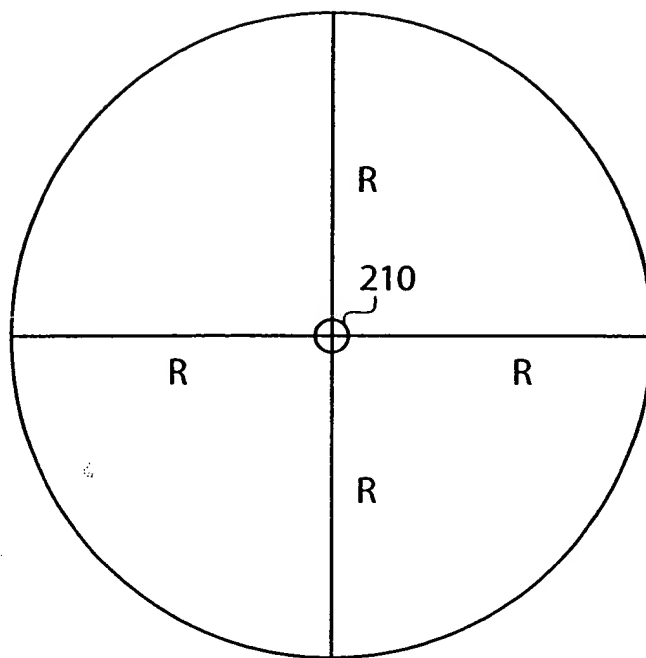


FIG. 2B

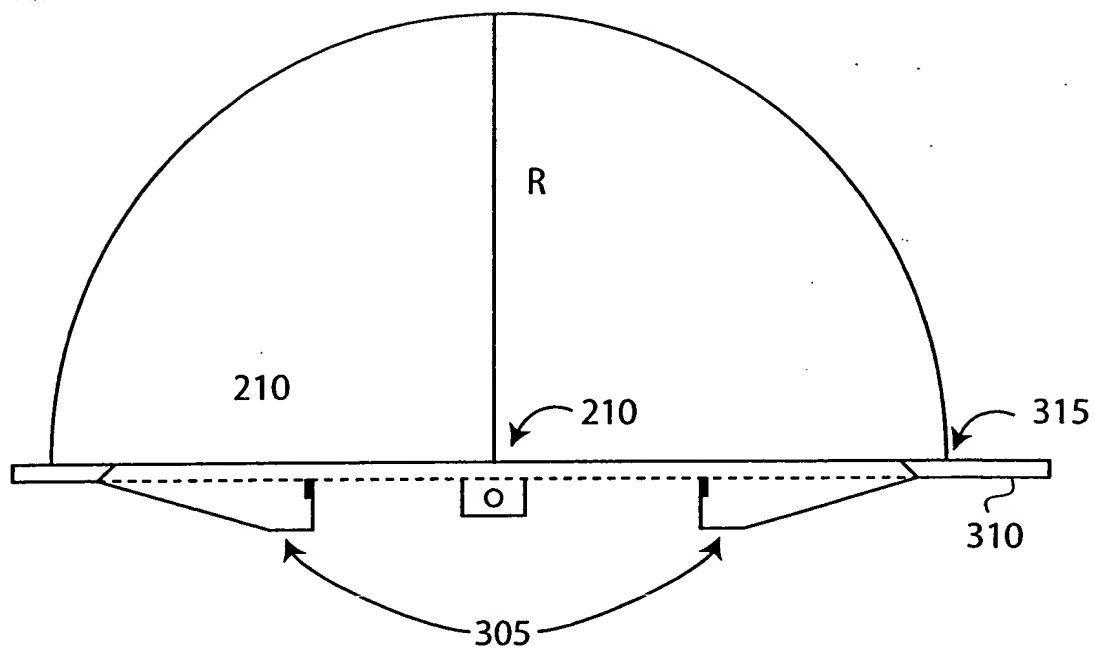


FIG. 3A

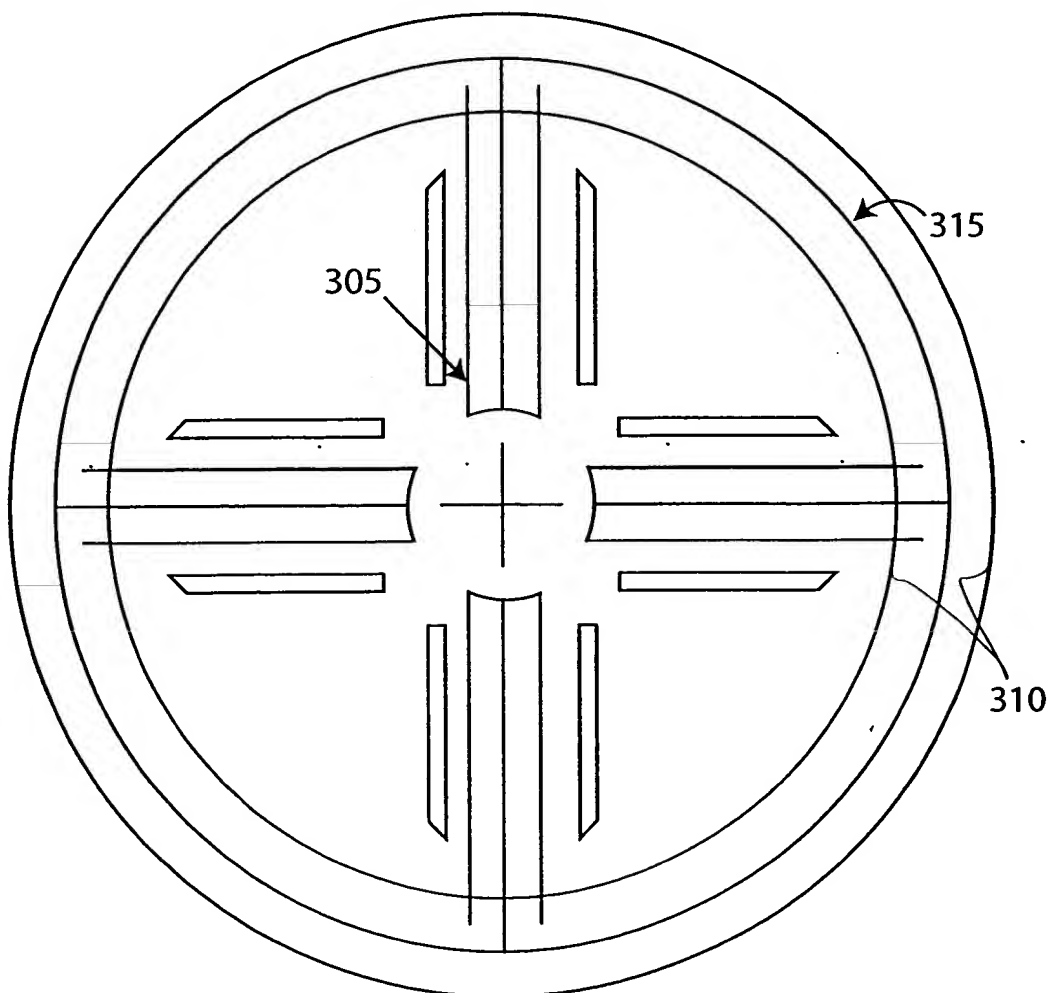


FIG. 3B

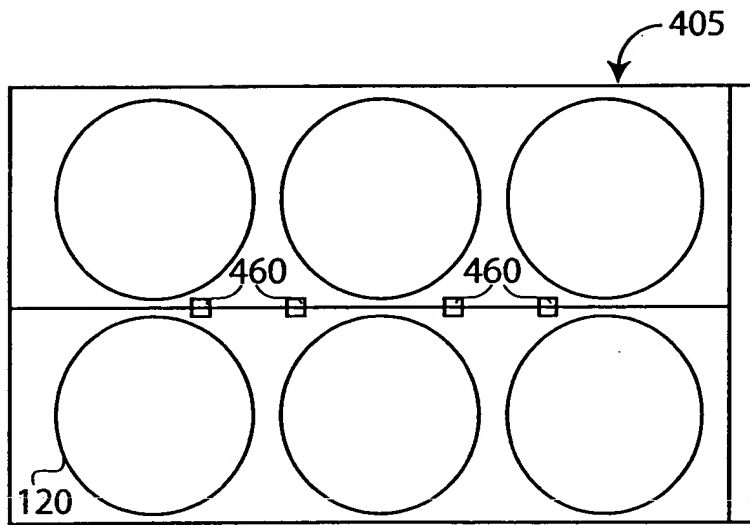


FIG. 4A

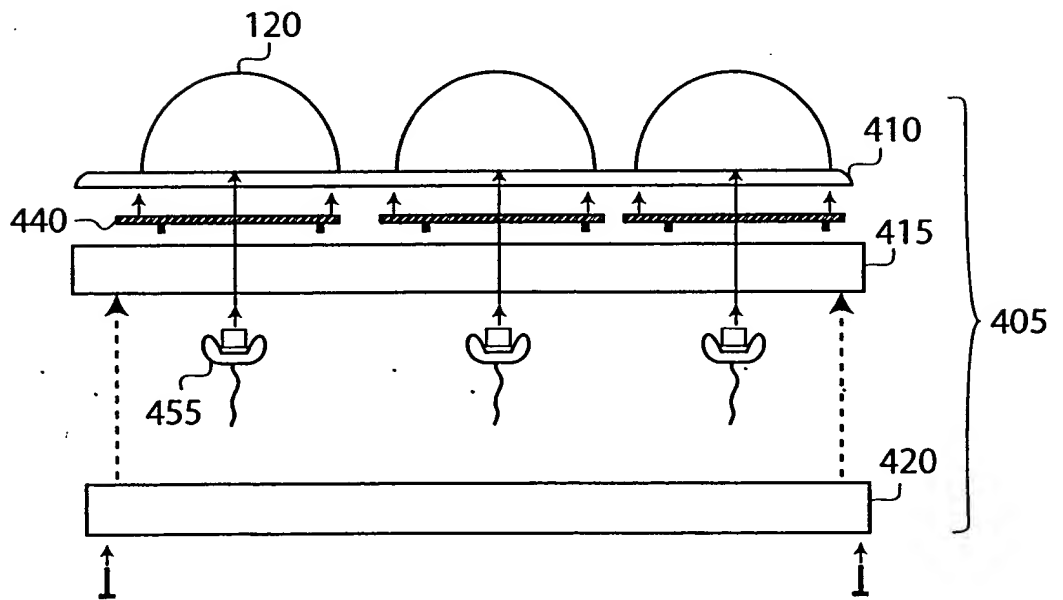


FIG. 4B

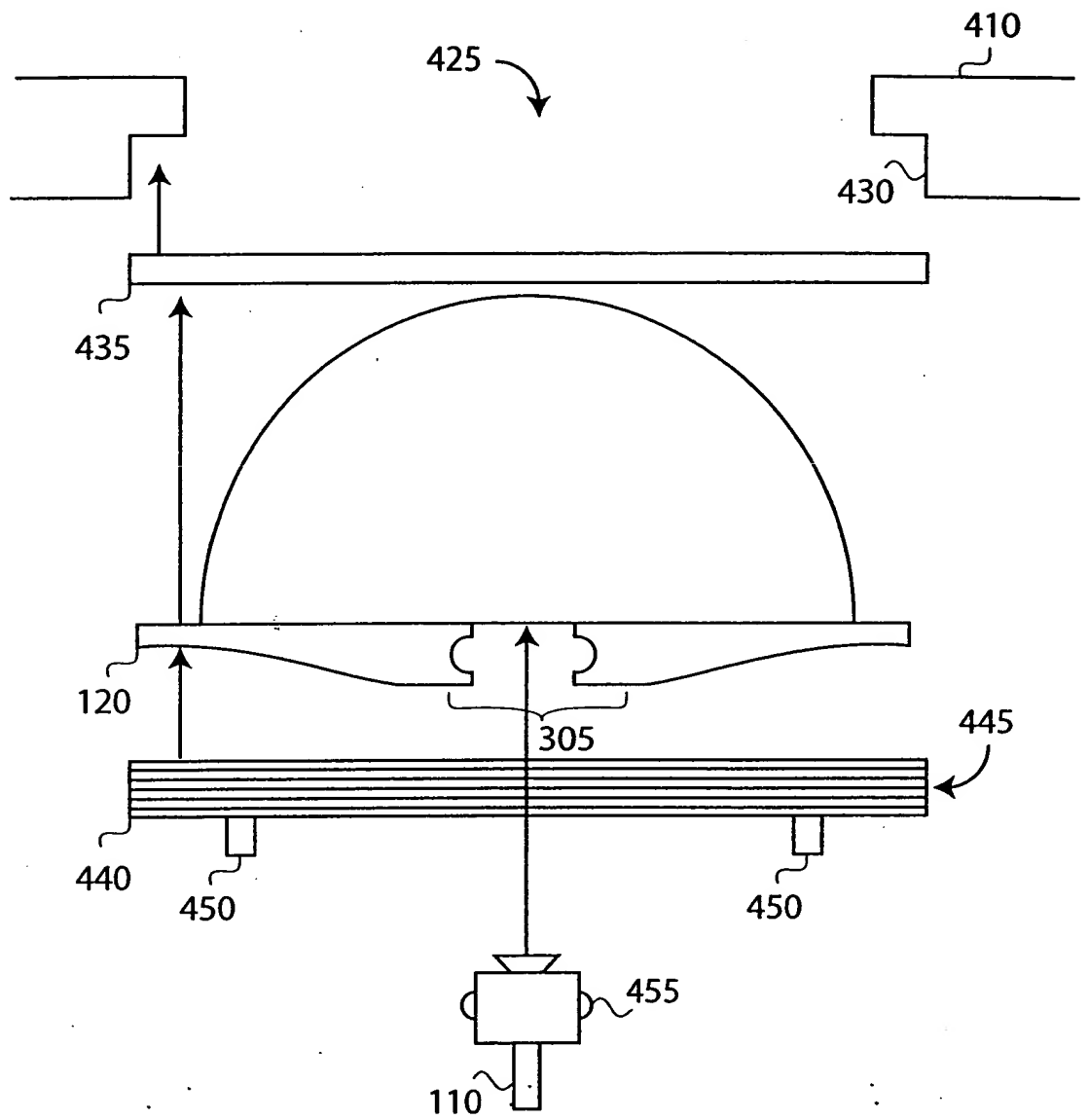


FIG. 4C

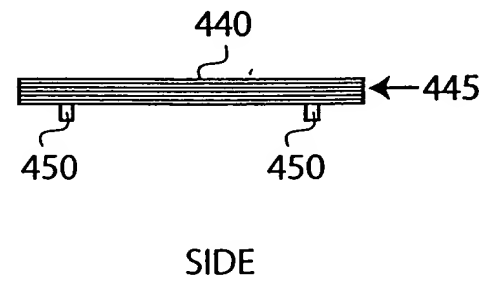
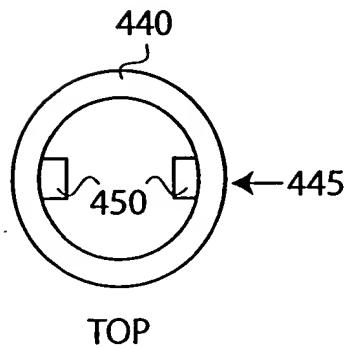


FIG. 4D

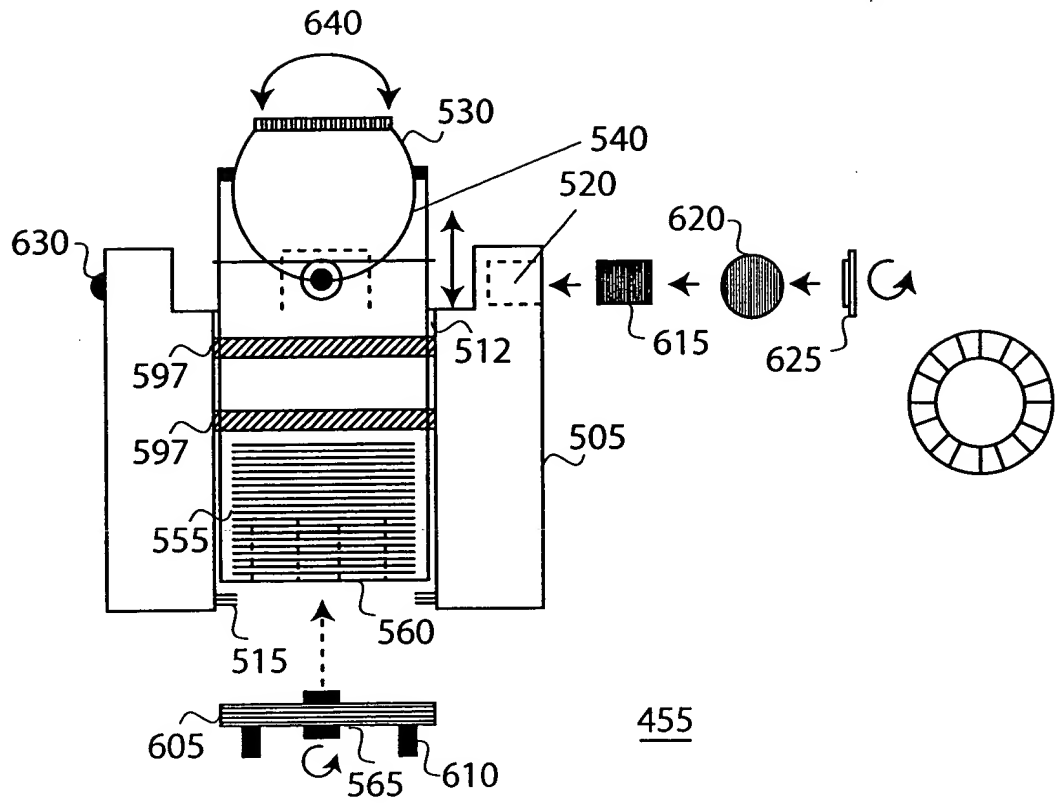


FIG. 6A

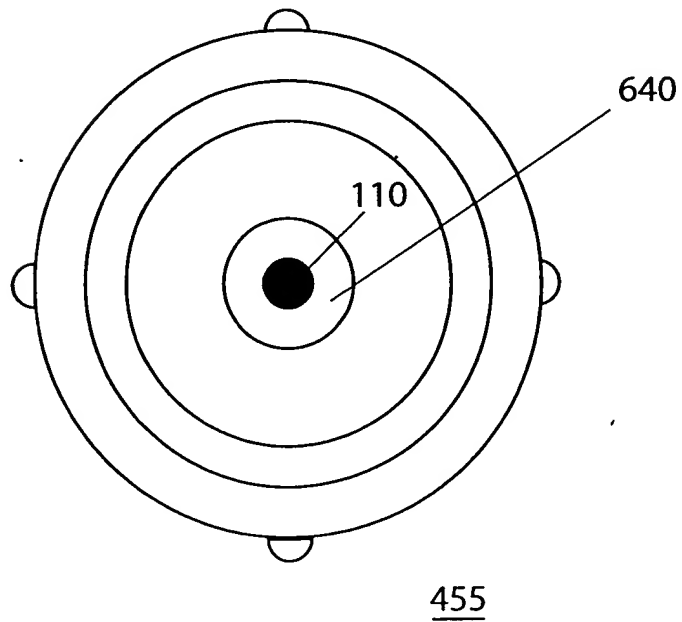


FIG. 6B

MIDDLE SECTION

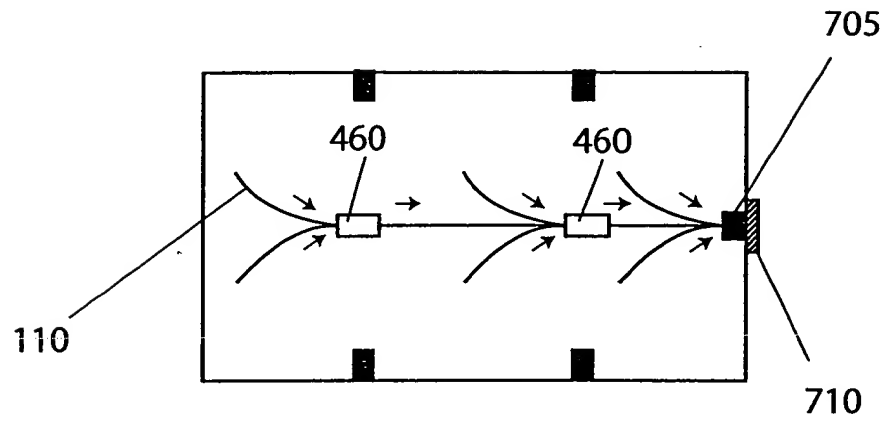


FIG. 7A

BOTTOM PANEL

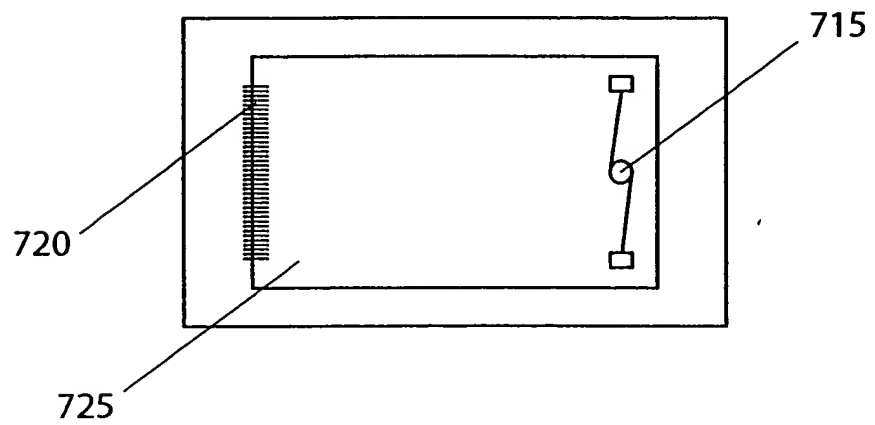


FIG. 7B

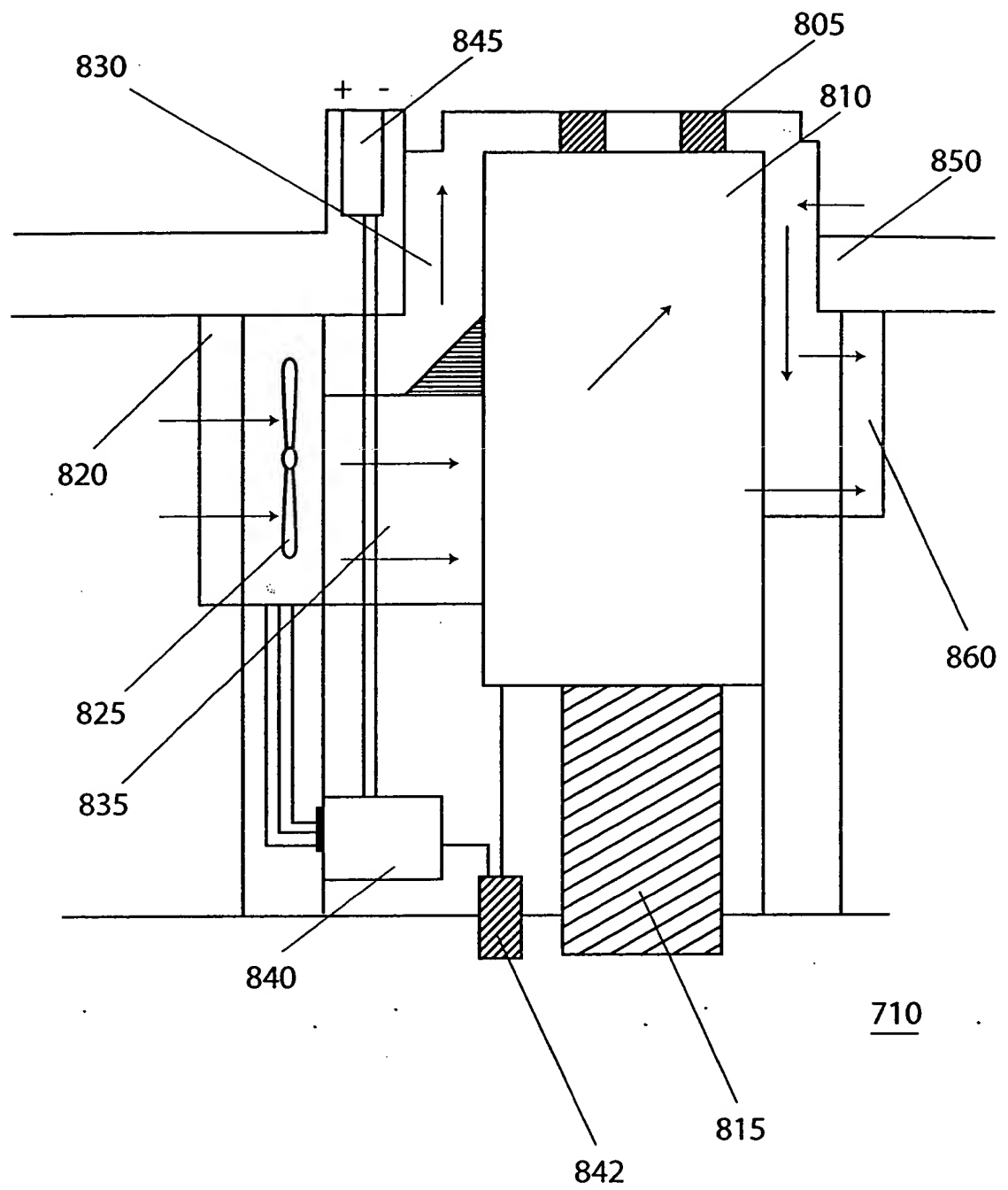


FIG. 8

FIG. 9

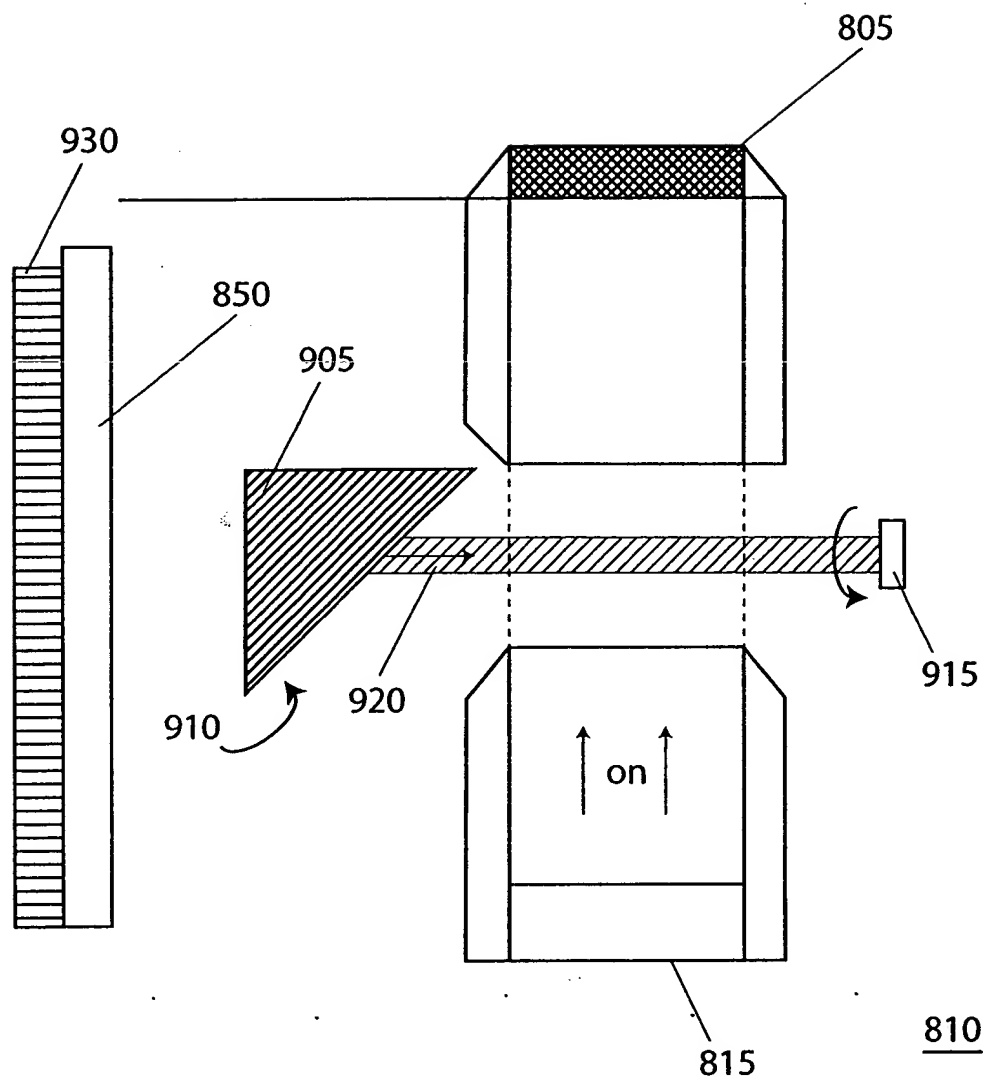


FIG. 9

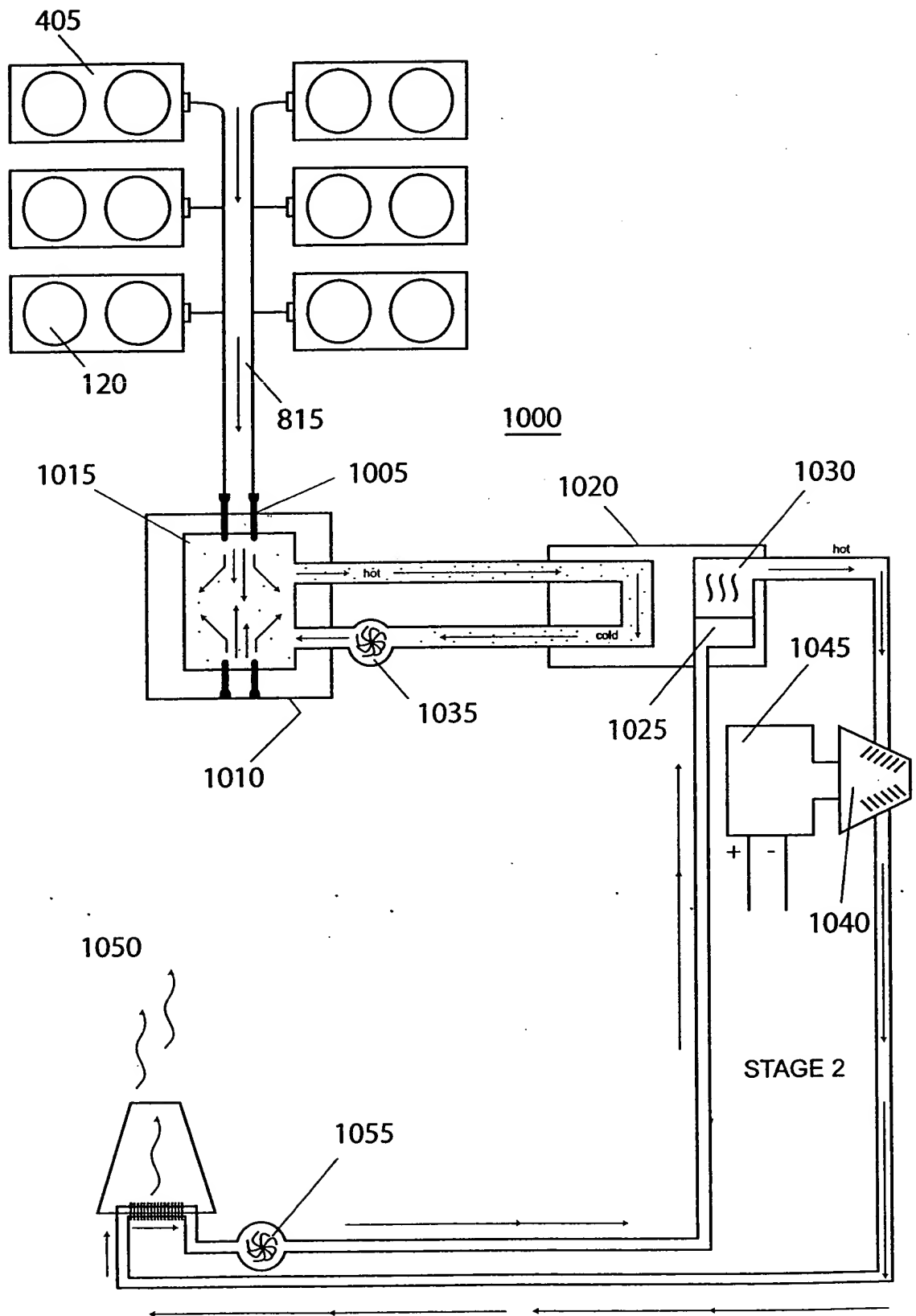


FIG. 10

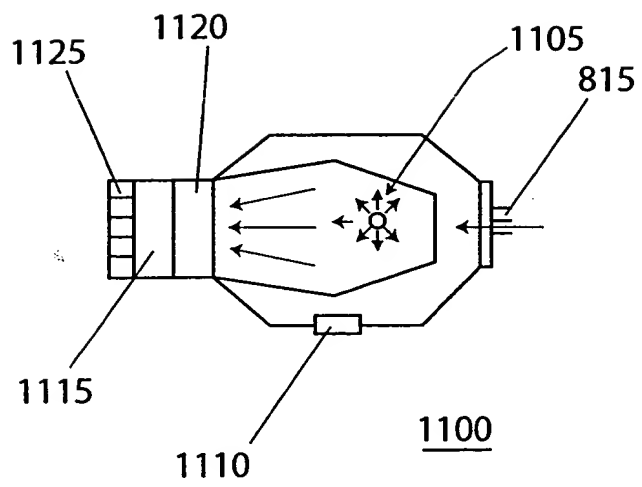


FIG. 11

FIG. 12

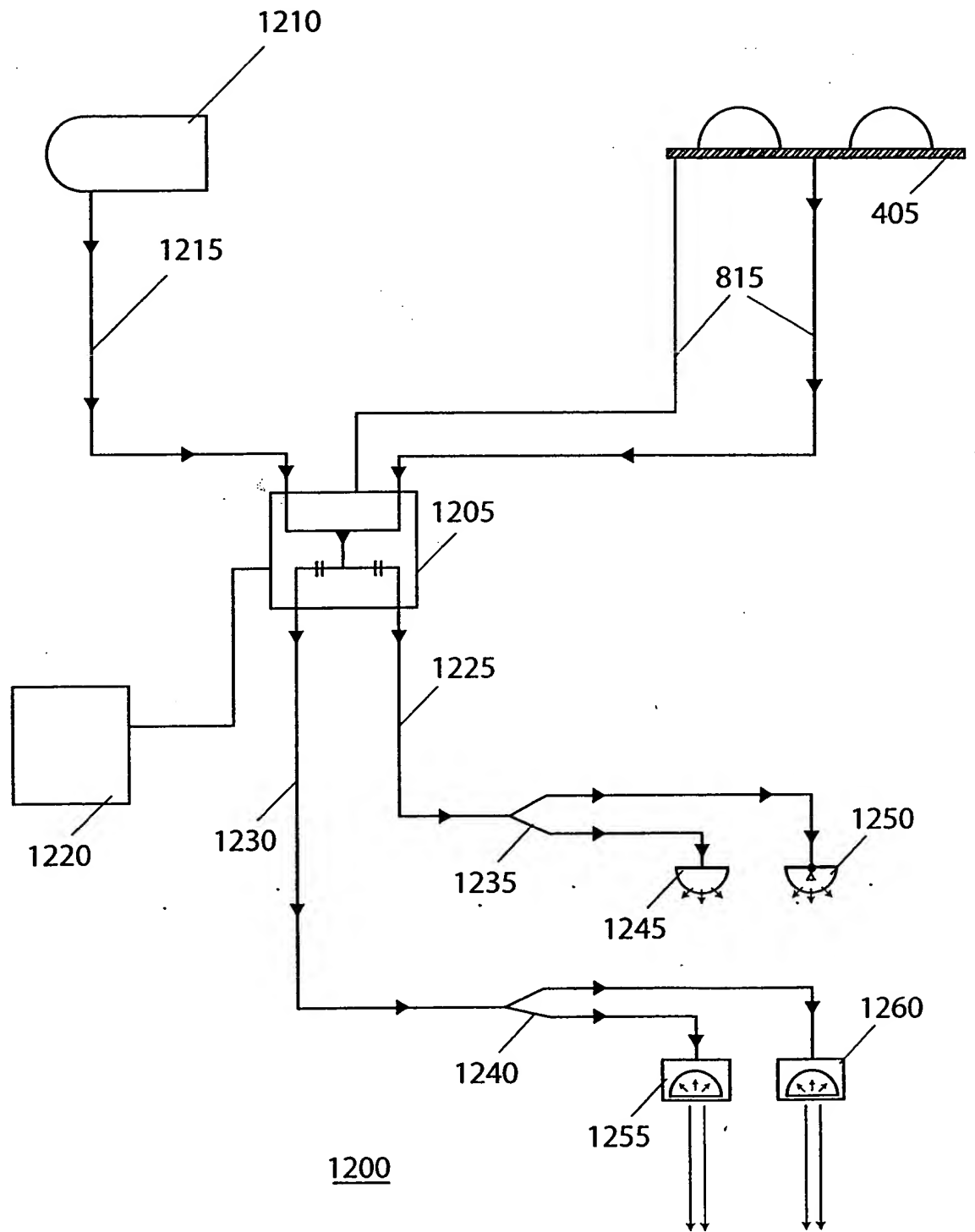


FIG. 12

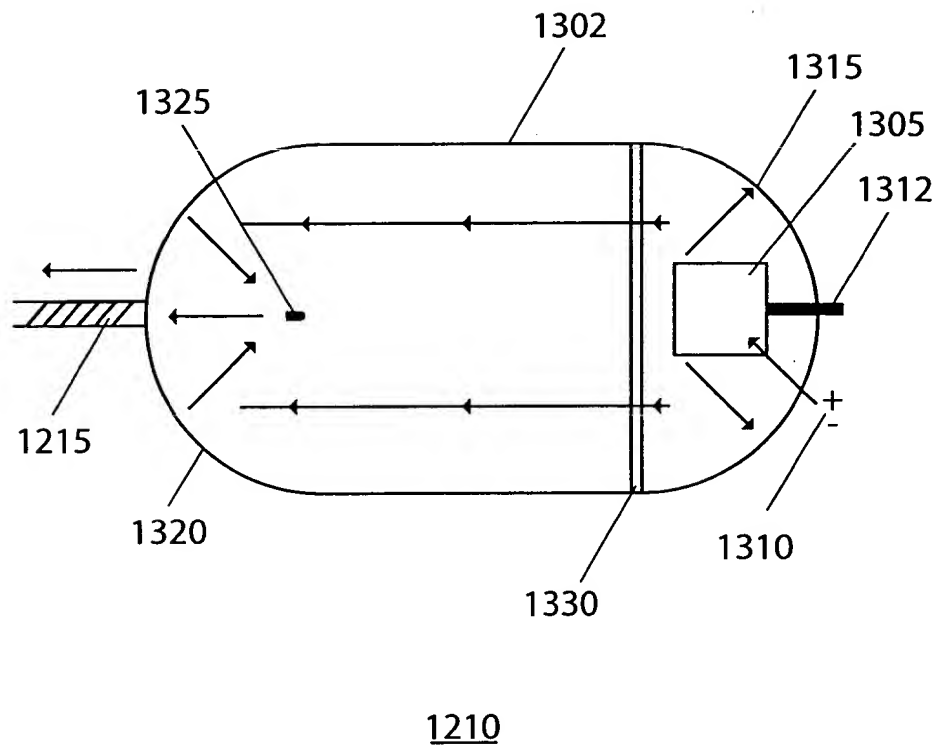


FIG. 13

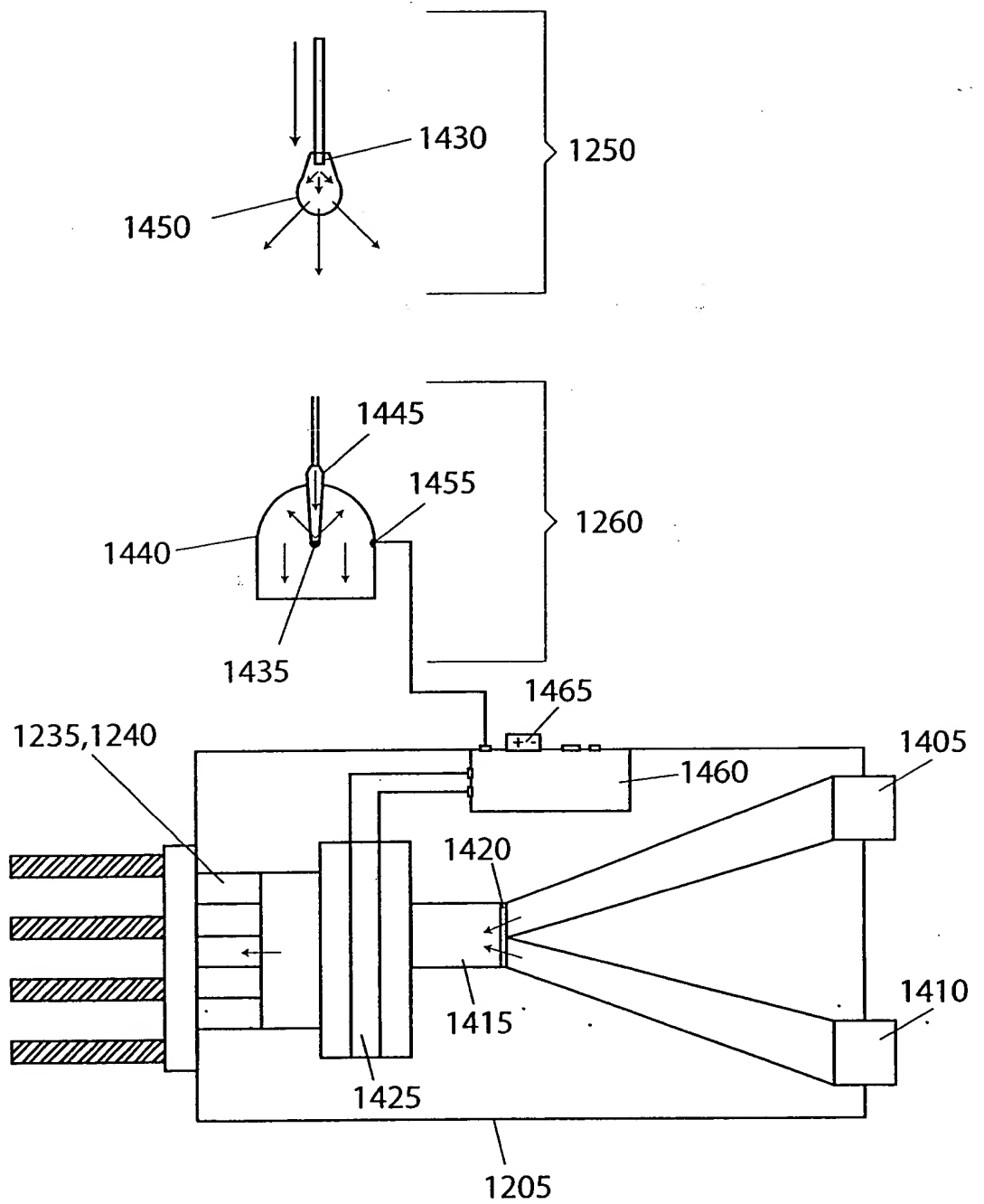


FIG. 14

2003-10-27 09:00:01

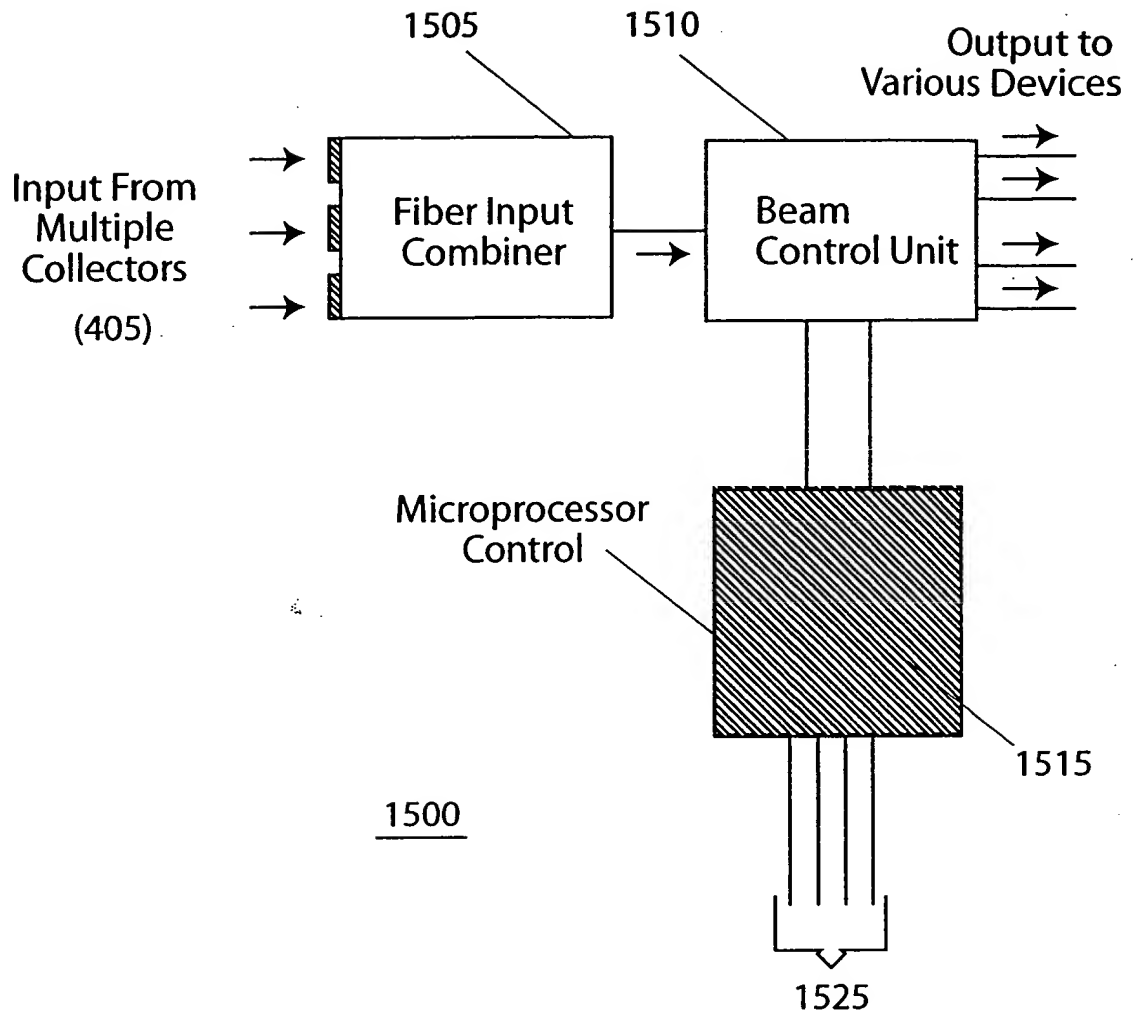


FIG. 15A

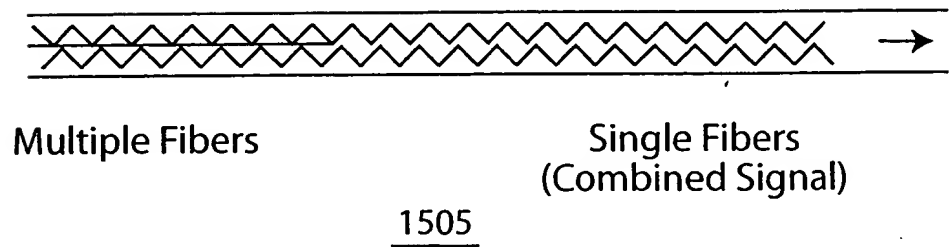


FIG. 15B

FIG. 16

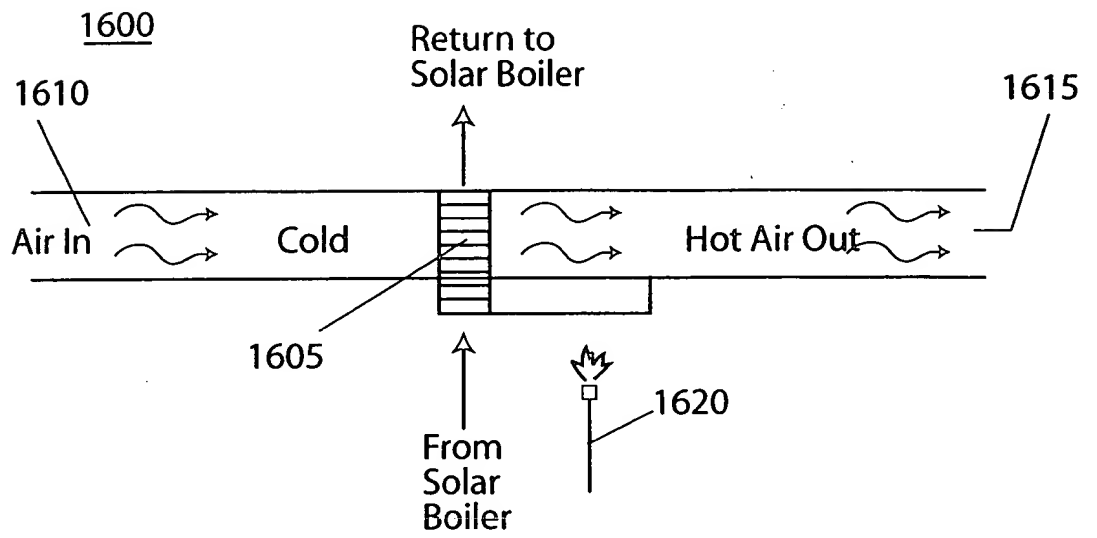


FIG. 16

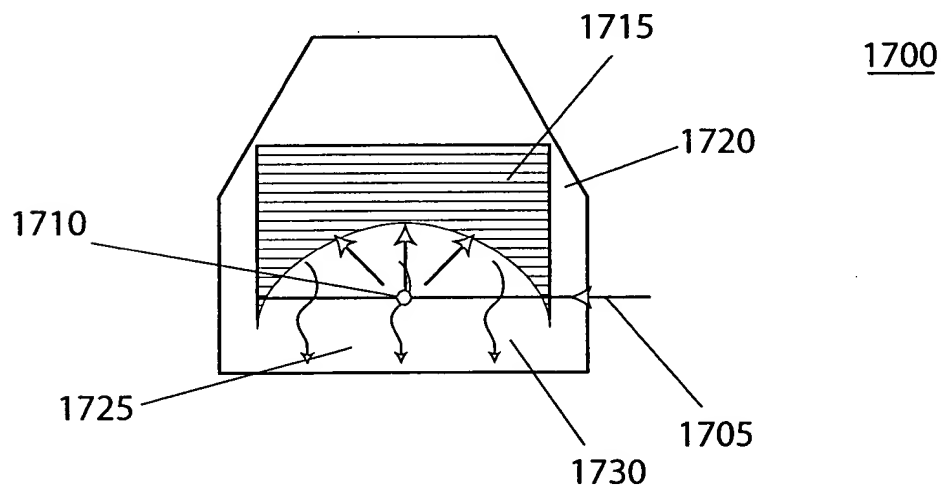


FIG. 17

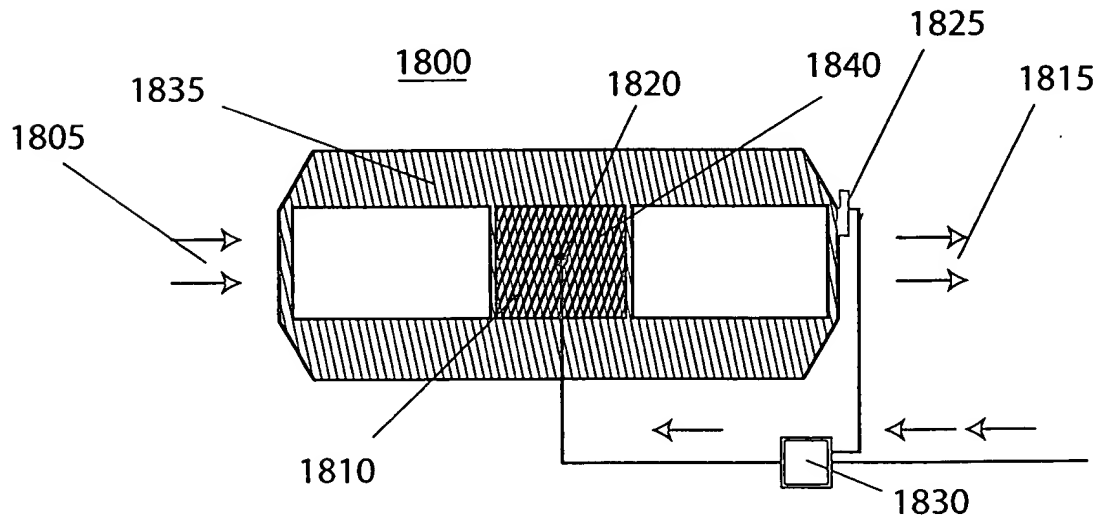


FIG. 18

Diagram illustrating a circular structure (1910) with a central dot. A trapezoidal protrusion (1915) is located on the left side of the circle. Two horizontal arrows (1905) point into the trapezoidal protrusion.



FIG. 20A

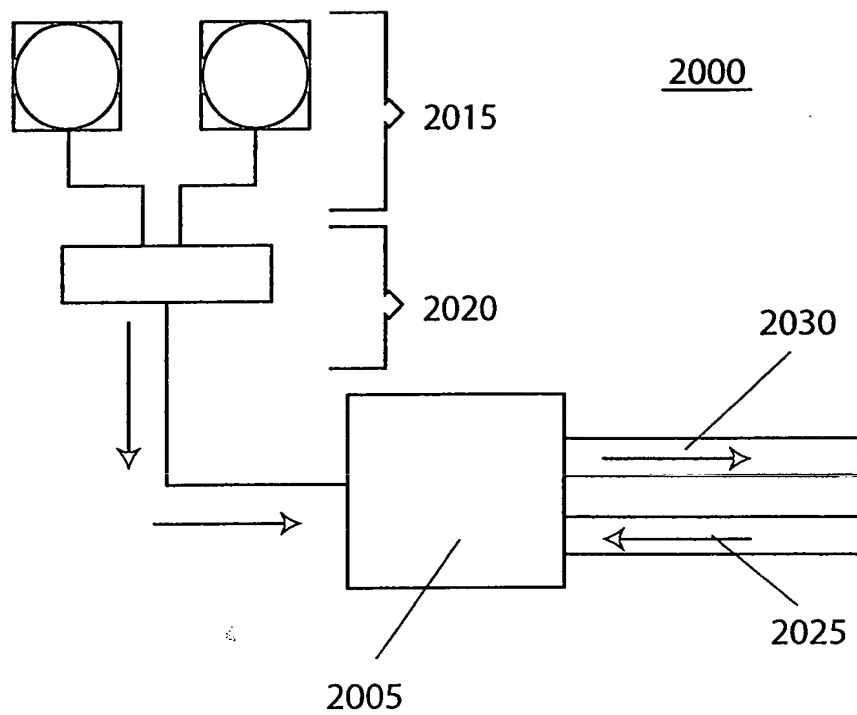


FIG. 20A

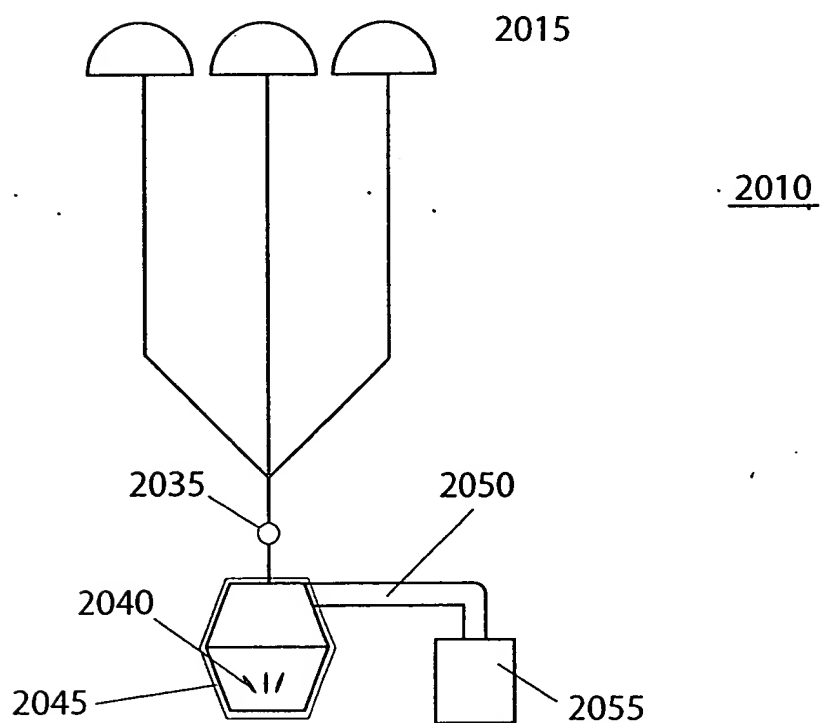


FIG. 20B

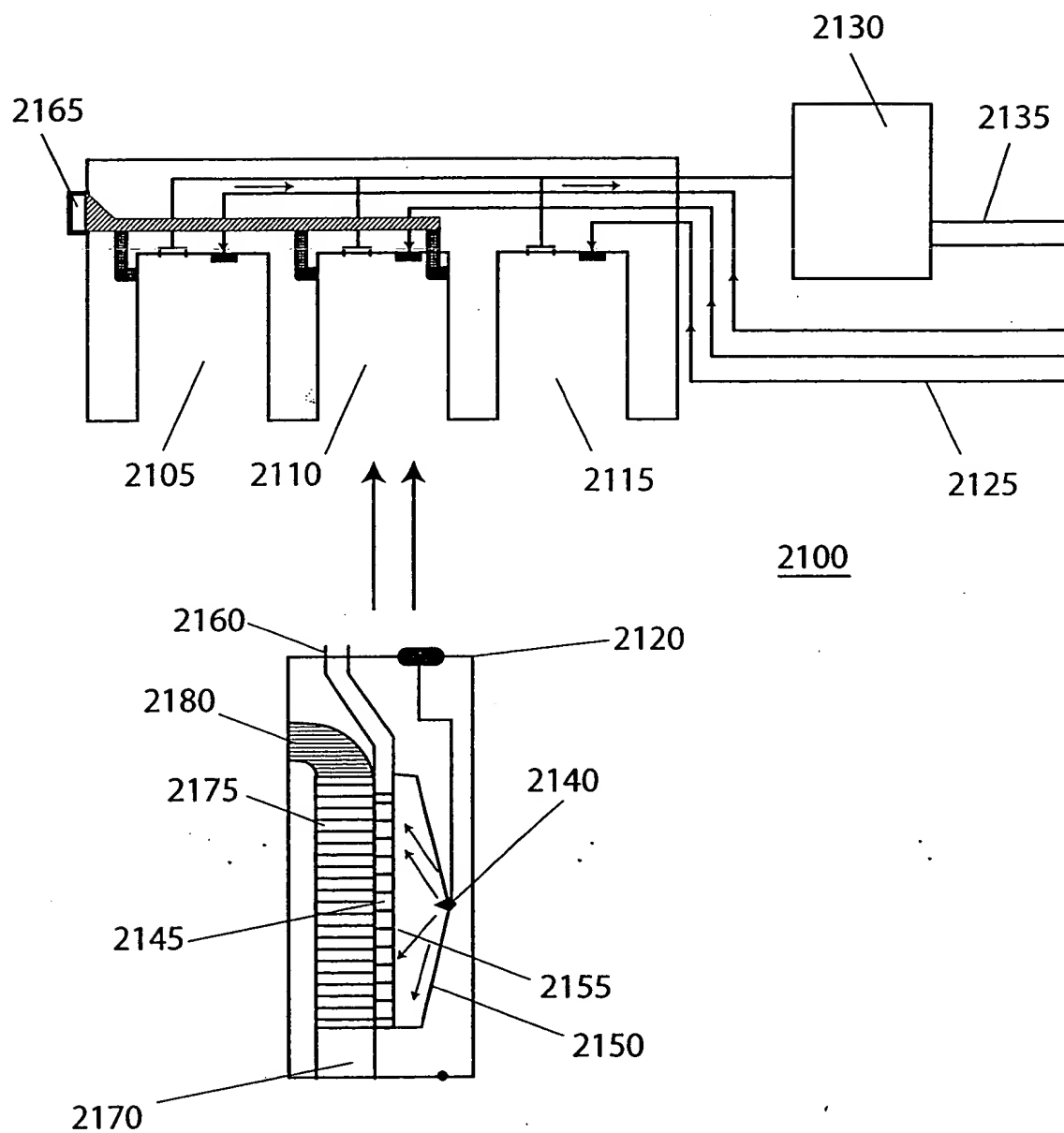


FIG. 21

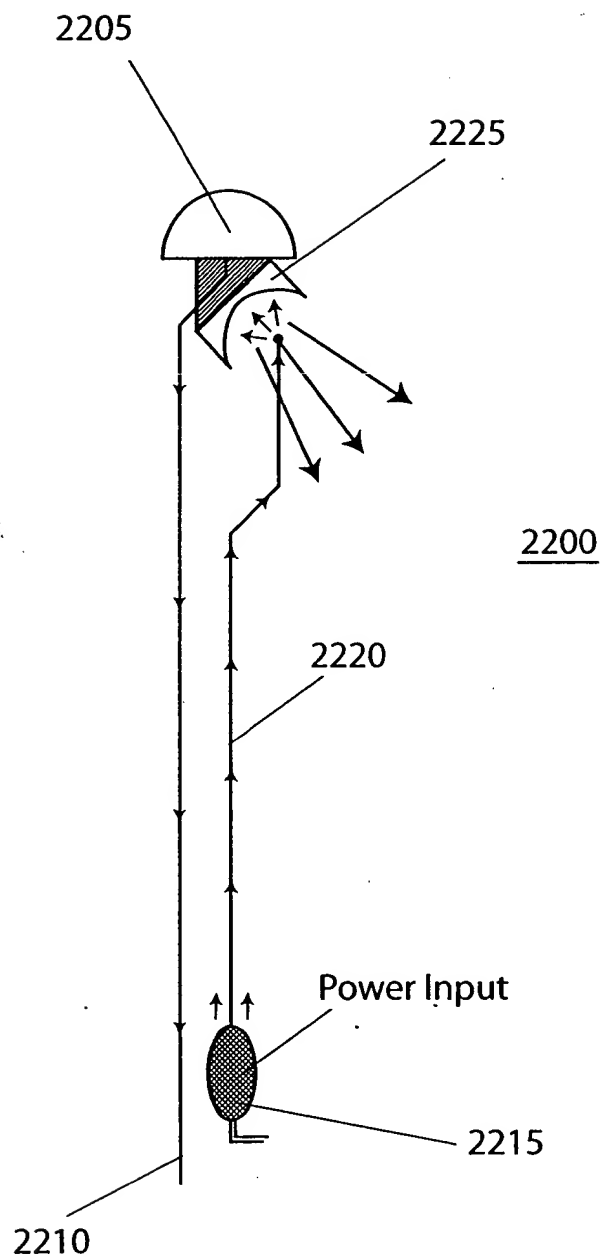


FIG. 22

FIG. 23

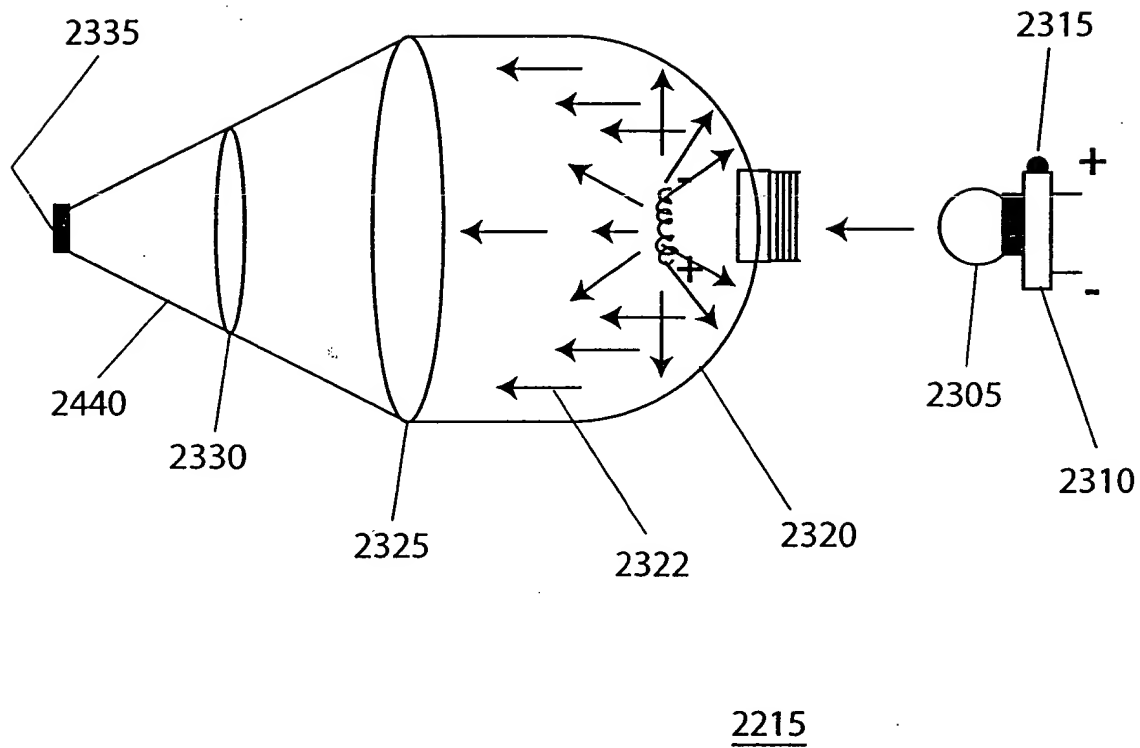


FIG. 23

FIG. 24

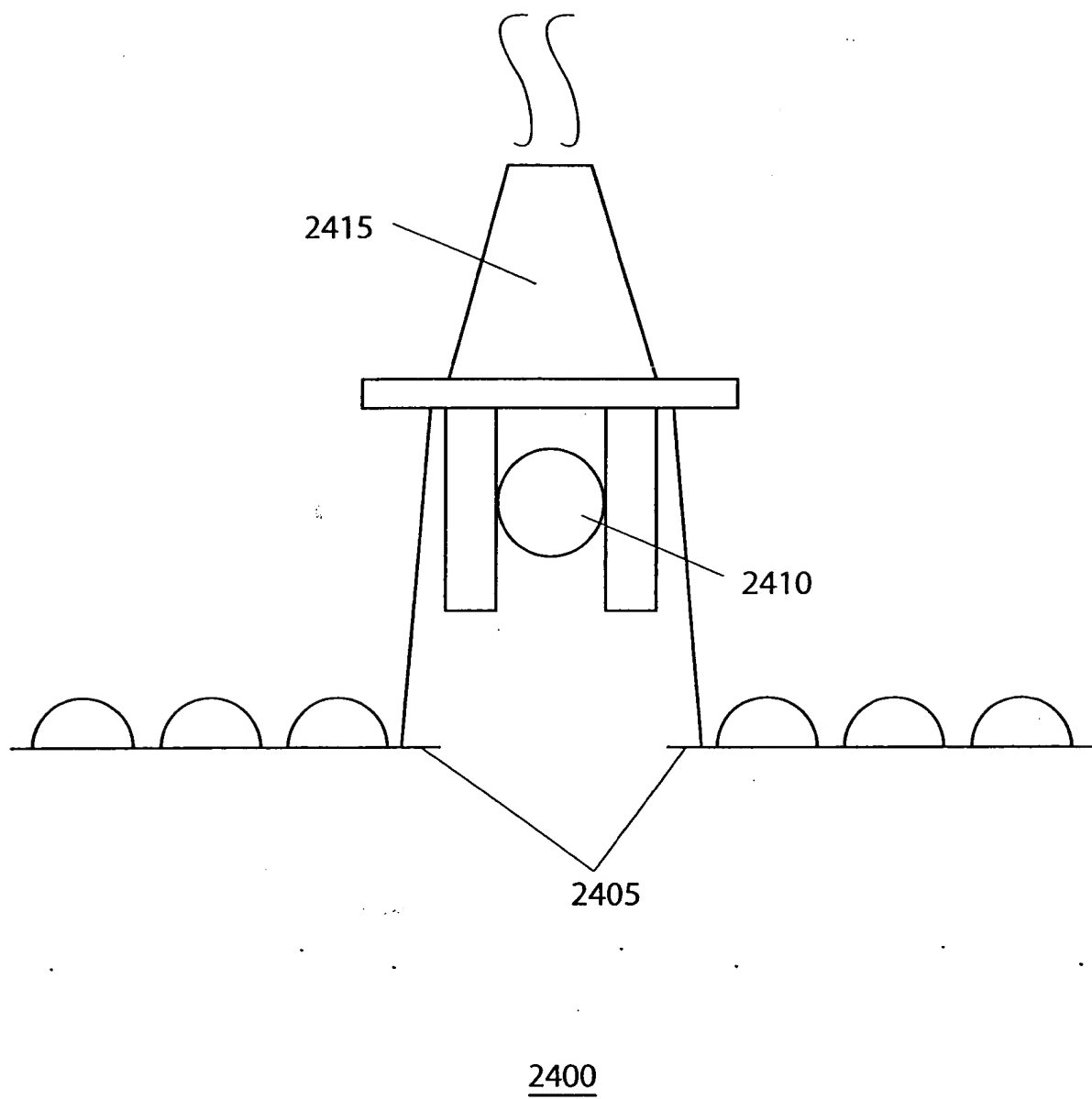


FIG. 24

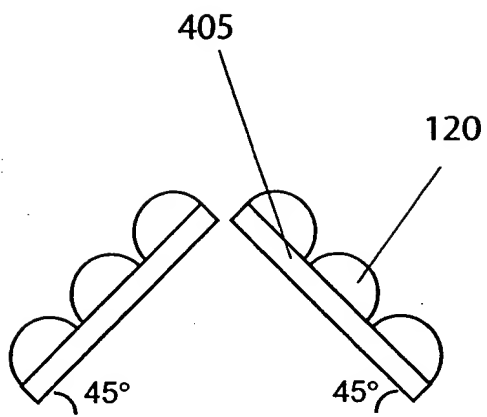


FIG. 25

A schematic diagram of an optical system. On the left, three parallel cylindrical lenses, labeled 2610, are shown with diagonal hatching. Arrows from these lenses point to a large, vertically oriented elliptical lens labeled 2605. This lens 2605 is part of a bracketed assembly. Arrows from 2605 point to a smaller, horizontally oriented elliptical lens. From this second lens, multiple arrows converge at a point labeled 2615. From 2615, several arrows diverge and point towards a circular component labeled 2620. Inside 2620, three arrows converge towards a central point.

FIG. 26



$n_1 = 1.4925$ Index of refraction: Media 01 [Air (STP)]
 $n_2 = 1.4925$ Index of refraction: Media 02 [Acrylic]
 $R = 0$ Radius of surface one = thickness of lens
 $B = \infty$ Radius of surface two = infinity
 Light source angle w.r.t. horizon

FIG. 28A

Note:
 Radius of surface one = thickness of lens
 Radius of surface two = infinity

Angles of Incidence and Refraction with Light Sources at Infinity

Angle of incidence	Surface 01		Surface 02	
	Angle of incidence	Angle of refraction	Angle of incidence	Angle of refraction
0	0	0	0	0
1	0.70940761	0.70940761	0.20097239	0.40961871
2	1.41870791	1.41870791	0.58129708	0.81938099
3	2.12799324	2.12799324	0.87220467	1.22901746
4	2.83635616	2.83635616	1.16344308	1.64091487
5	3.54468863	3.54468863	1.45511637	2.05133014
6	4.25281398	4.25281398	1.74711802	2.46338205
7	4.96082616	4.96082616	2.04017839	2.87641155
8	5.66872848	5.66872848	2.33378715	3.29058924
9	6.37652839	6.37652839	2.62809161	3.70600743
10	7.08422832	7.08422832	2.92373418	4.12303216
11	7.79173468	7.79173468	3.22026532	4.54162635
12	8.49901716	8.49901716	3.51804284	4.96092915
13	9.20608824	9.20608824	3.81713173	5.38245386
14	9.91295661	9.91295661	4.11763439	5.80916079
15	10.58070861	10.58070861	4.41973136	6.23614325
16	11.24834469	11.24834469	4.72348511	6.66566932
17	11.91586327	11.91586327	5.02903672	7.09792316
18	12.58326092	12.58326092	5.33659079	7.53310949
19	13.25052713	13.25052713	5.64607866	7.97140896
20	13.91767292	13.91767292	5.95772078	8.4130246
21	14.58470816	14.58470816	6.27171784	8.85816087
22	15.25163299	15.25163299	6.58815127	9.30703575
23	15.91844847	15.91844847	6.90715698	9.75982422
24	16.58515482	16.58515482	7.22887179	10.21679955
25	17.25175211	17.25175211	7.55343685	10.67815138
26	17.91824043	17.91824043	7.88099587	11.14418117
27	18.58461978	18.58461978	8.21169562	11.61496458
28	19.25089016	19.25089016	8.546980	12.0904999
29	19.91705157	19.91705157	8.88312155	12.5710891
30	20.58310399	20.58310399	9.22415849	13.0567137
31	21.24904743	21.24904743	9.56895816	13.55170338
32	21.91488186	21.91488186	9.91768534	14.05057922
33	22.58060729	22.58060729	10.27050889	14.5588243
34	23.24622372	23.24622372	10.62740182	15.07690332
35	23.91173115	23.91173115	10.98914146	15.59859043
36	24.57712858	24.57712858	11.35530957	16.11333662
37	25.24241601	25.24241601	11.72629253	16.64746971
38	25.90759344	25.90759344	12.10228139	17.18940208

Corresponding Geometric/Trigonometric Spherical Collector Variables

H	X	Y	h	Z
	Ray transmission dist.	$y = H - h$	Incident ray height Surface 02	Focal Length
0	0	0	0	0
1	0.104714439	0.090426387	0.074288052	10.59944941
2	0.20939698	0.069837771	0.14855921	10.38717835
3	0.314015737	0.091219141	0.222796596	10.38656355
4	0.418538842	0.121554476	0.296983367	10.27121219
5	0.522934456	0.151831731	0.371102726	10.34895477
6	0.62717078	0.18202835	0.445137945	10.47078922
7	0.73121606	0.21210684	0.519072377	10.35911957
8	0.835038606	0.24214913	0.592889476	10.31209945
9	0.93860679	0.27203979	0.666572812	10.59700057
10	1.04189566	0.30178809	0.740106089	10.56722851
11	1.144833972	0.33138069	0.813473164	10.40948011
12	1.247470145	0.360812083	0.886638002	10.21231544
13	1.349706336	0.390061228	0.959644998	10.18187807
14	1.451531374	0.419112982	1.032418592	10.47703144
15	1.552914271	0.44791138	1.104962891	10.11194453
16	1.653824135	0.476560748	1.177633386	10.07653577
17	1.754320228	0.504925192	1.249205046	10.03297363
18	1.854101966	0.533028882	1.321073285	9.989914021
19	1.953408927	0.560855045	1.392533882	9.946467291
20	2.05207697	0.588387951	1.463732909	9.89811745
21	2.150207697	0.615610898	1.534598	9.84597946
22	2.24763956	0.642507199	1.605132562	9.794298131
23	2.344386771	0.66903966	1.675326805	9.7431343
24	2.440419858	0.69523095	1.745167764	9.69243172
25	2.53570957	0.721066246	1.814643324	9.64263651
26	2.630226881	0.746496722	1.883742053	9.59353216
27	2.723942998	0.771485974	1.952453024	9.54533853
28	2.816829377	0.79603327	2.020763849	9.49799548
29	2.908837721	0.820187012	2.08867071	9.45138531
30	3.000228449	0.843941612	2.156138388	9.40547559
31	3.091303304	0.86708145	2.223222005	9.36031929
32	3.179515585	0.889667035	2.289848351	9.31604399
33	3.26782421	0.911798289	2.356035927	9.27337307
34	3.355157421	0.933381434	2.421775987	9.23233241
35	3.441458618	0.95495346	2.487063072	9.19281253
36	3.526711514	0.976491966	2.551892262	9.15481252
37	3.610890159	0.998000222	2.616259917	9.11846582
38	3.693968852	1.019610121	2.680162731	9.083679347

FIG. 2.8B

39	26.51652792	12.4847208	17.7397783	3.77592346	4.66287569	1.03232348	2.74398778	8.57625936
40	27.12593451	12.87006549	18.2988394	3.85672438	4.59626659	1.05015883	2.80656703	8.48064197
41	27.7773244	13.2628756	18.8670097	3.93634174	4.53823781	1.06778643	2.86906772	8.39543123
42	28.33971056	13.66028944	19.4446287	4.01478638	4.48086953	1.08481639	2.93110199	8.32267776
43	28.9556242	14.06434758	20.03211626	4.09199016	4.38812221	1.09931773	2.99267287	8.25779150
44	29.52531624	14.47465376	20.6298918	4.16795023	4.31603802	1.11416756	3.05378266	8.11168121
45	30.10833477	14.89146523	21.2383217	4.24264087	4.24264087	1.12820270	3.11445798	8.01330873
46	30.68501525	15.31498475	21.85807206	4.31603802	4.16795023	1.14139385	3.17464627	7.91396453
47	31.25433928	15.74546062	22.48940255	4.38812221	4.09199016	1.15371066	3.23441164	7.81564168
48	31.81686329	16.18313671	23.13288383	4.45282578	4.01478638	1.16512123	3.29374774	7.71951333
49	32.37173152	16.62826248	23.78920946	4.52025781	3.93634174	1.17559716	3.35066476	7.63512249
50	32.91737073	17.08109297	24.45337482	4.59016659	3.85672438	1.18509077	3.41117591	7.49517692
51	33.45811177	17.54188873	25.14148516	4.66287569	3.77592346	1.19379442	3.46729626	7.39221657
52	33.98908421	18.01091579	25.83890998	4.72806452	3.69396852	1.20102134	3.52403176	7.28339701
53	34.51155446	18.48844554	26.55138696	4.79181306	3.610800139	1.20737257	3.58435374	7.18118357
54	35.0252454	18.97475246	27.27944409	4.85410196	3.526711514	1.21260623	3.64149570	7.08442301
55	35.5298753	19.4701247	28.023802	4.91491266	3.44145818	1.21666308	3.69824697	6.99442301
56	36.02515758	19.97484242	28.78317664	4.97422455	3.355157421	1.21950948	3.75471608	6.90997135
57	36.51080101	20.48919899	29.56437228	5.03202408	3.26783421	1.22109151	3.81097256	6.81913257
58	36.98659999	21.01346001	30.3620495	5.08288577	3.17951585	1.22160668	3.86697208	6.73126534
59	37.45198491	21.54801759	31.17915632	5.14000804	3.09022849	1.22036853	3.92237951	6.64531281
60	37.9069247	22.0907733	32.01657818	5.196152423	3	1.217751475	3.97840048	6.56057564
61	38.35101617	22.6488383	32.87524766	5.247718243	2.908857721	1.213759416	4.03395827	6.47416103
62	38.78395671	23.12604329	33.75917321	5.297085357	2.816829377	1.20822835	4.089457207	6.38779531
63	39.20343259	23.79436741	34.66043166	5.346039145	2.732942998	1.20109307	4.14645638	6.30040719
64	39.61513065	24.39488935	35.58917644	5.392764778	2.630226881	1.192286413	4.20047785	6.21697064
65	40.01273673	24.98726327	36.54364741	5.437846722	2.53709537	1.181734611	4.25612111	6.13651069
66	40.39793637	25.6020563	37.52518246	5.481277746	2.440419858	1.169361359	4.311911387	6.054781546
67	40.77041554	26.22938446	38.5325143	5.520209121	2.344386771	1.155085297	4.367943824	5.984337497
68	41.12986146	26.87013854	39.57537291	5.563103127	2.24765956	1.13820089	4.42423039	5.917722237
69	41.47596348	27.52403652	40.64733468	5.601483359	2.150207697	1.120474023	4.48108836	5.84910544
70	41.80841397	28.19138603	41.75301862	5.638155725	2.05212086	1.099949583	4.538268142	5.7840317
71	42.1269931	28.87309569	42.8945316	5.673111454	1.953408927	1.077142687	4.595988487	5.745777649
72	42.43115085	29.56884913	44.07423388	5.706339098	1.854101966	1.051943363	4.654395533	5.697289211
73	42.72084602	30.27915398	46.55906763	5.737828336	1.754230228	1.02433376	4.71339516	5.65348143
74	43.00420066	31.00420066	47.87064206	5.767570176	1.653824135	0.993886563	4.77383813	5.610713817
75	43.254636	31.7445364	49.2342443	5.795554928	1.552914271	0.96767733	4.834787225	5.56974612
76	43.4984092	32.50015908	50.63205155	5.824774538	1.451513174	0.934627771	4.897041221	5.528722827
77	43.72835392	33.27141608	52.13201871	5.84620389	1.34976326	0.84283537	4.96092617	5.493814523
78	43.94144685	34.03855315	53.67993506	5.868885604	1.247470145	0.79757069	5.025600235	5.460713154
79	44.13819671	34.86180229	55.30388401	5.889763101	1.144853972	0.74816093	5.09226038	5.42816152
80	44.31861435	35.68138565	57.0139464	5.91630044	0.93860679	0.694976354	5.160886425	5.397340858
81	44.48249556	36.51750444	58.82208545	5.94168412	0.83508606	0.637747022	5.23115369	5.369340858
82	44.62963209	37.37034791	60.74787382	5.95527691	0.73121606	0.576290164	5.30857769	5.34222073
83	44.75991262	38.2408738	62.81150154	5.96717078	0.62717078	0.510176546	5.37903746	5.31748227
84	44.87312667	39.1268763	65.04630452	5.977168189	0.522934456	0.439274133	5.456954827	5.293197225
85	44.96915043	40.0308497	67.50093298	5.98348302	0.41833842	0.36321687	5.537894056	5.27697147
86	45.04787751	40.95212249	70.23444896	5.99177209	0.314015737	0.28169912	5.622167614	5.264614621
87	45.1097096	42.84692802	73.45196394	5.99344962	0.20939698	0.19422344	5.71018097	5.25789131
88	45.15307198	44.8907904	77.42305777	5.99988171	0.104714439	0.10488794	5.807122419	5.24949919
89	45.17941097	43.8203803	83.4397493	5.99988171	3.67545E-16	3.65138E-16	5.896596377	5.24949919
90	45.18819423	44.81180577						5.896596377

FIG. 28C

Angles of Incidence and Refraction with Light Source at Infinity

Angle of incidence	Surface 01		Surface 02	
	1	2	3	4
-48	-41.1288146	-41.1288146	48.87013854	#N/D
-47	-40.77041554	-40.77041554	48.22958446	#N/D
-46	-40.39795057	-40.39795057	47.80206363	#N/D
-45	-40.01727673	-40.01727673	46.98726327	#N/D
-44	-39.61131065	-39.61131065	46.38486935	#N/D
-43	-39.20434259	-39.20434259	45.79456741	#N/D
-42	-38.78905671	-38.78905671	45.21604329	#N/D
-41	-38.35101617	-38.35101617	44.64883883	#N/D
-40	-37.90692247	-37.90692247	44.09377553	82.14054576
-39	-37.45198491	-37.45198491	43.54801509	78.76321707
-38	-36.98650999	-36.98650999	43.01349001	76.20499842
-37	-36.51080101	-36.51080101	42.48919899	74.06683151
-36	-36.02315758	-36.02315758	41.97484242	72.19038304
-35	-35.5298753	-35.5298753	41.4701247	70.51701571
-34	-35.032454	-35.032454	40.9747546	68.98279904
-33	-34.53115546	-34.53115546	40.48844554	67.50309997
-32	-34.02608421	-34.02608421	40.01091579	66.23984632
-31	-33.5188073	-33.5188073	39.54188873	64.99534861
-30	-33.0090703	-33.0090703	39.08109297	63.81006493
-29	-32.49773752	-32.49773752	38.62826248	62.70210129
-28	-31.9846329	-31.9846329	38.18313671	61.67375721
-27	-31.4693938	-31.4693938	37.74546062	60.61904947
-26	-30.95201525	-30.95201525	37.31498475	59.64238737
-25	-30.4323477	-30.4323477	36.89146523	58.70334442
-24	-29.91036524	-29.91036524	36.47466376	57.79849363
-23	-29.3863432	-29.3863432	36.06434758	56.92885399
-22	-28.8601056	-28.8601056	35.66028944	56.07995901
-21	-28.33173244	-28.33173244	35.26226756	55.26146682
-20	-27.7995451	-27.7995451	34.86742573	54.46742573
-19	-27.26352792	-27.26352792	34.48347208	53.69607149
-18	-26.723971861	-26.723971861	34.10228139	52.94382596
-17	-26.180470747	-26.180470747	33.72629253	52.21526514
-16	-25.632770747	-25.632770747	33.35330957	51.5011057
-15	-25.081083854	-25.081083854	32.98914146	50.80817757
-14	-24.52539818	-24.52539818	32.62760182	50.12841317
-13	-23.97499111	-23.97499111	32.27050889	49.4638337
-12	-23.428231465	-23.428231465	31.91768353	48.81653384
-11	-22.8853104183	-22.8853104183	31.56893817	48.18049146
-10	-22.34675815	-22.34675815	31.2241585	47.55753422
-9	-21.81241585	-21.81241585	30.88833852	46.94633852

Corresponding Geometric/Triometric Spherical Collector Variables

X	M	W	L	Y	T	S	Delta Q
0	6	180	1.11755E-16	8.41762E-16	-6	#N/D	#N/D
0.10471439	5.999086171	179	0.157194083	0.117238501	-5.88184767	#N/D	-5.88184767
0.20939698	5.990344962	178	0.31055094	0.229335342	-5.76700942	#N/D	-5.76700942
0.31401577	5.991777209	177	0.46023016	0.336300008	-5.651186001	#N/D	-5.651186001
0.418538842	5.983184302	176	0.60072444	0.439276738	-5.546107563	#N/D	-5.546107563
0.523934456	5.977168189	175	0.750013841	0.531493298	-5.439522489	#N/D	-5.439522489
0.62711078	5.967131572	174	0.890310832	0.61918408	-5.335212964	#N/D	-5.335212964
0.73121606	5.95527691	173	1.027818185	0.722311078	-5.22963832	74.83912566	74.83912566
0.83503806	5.941608412	172	1.162667156	0.850013094	-5.132595318	51.90479777	51.90479777
0.93860679	5.926130044	171	1.294992188	0.972200684	-5.03929296	41.91235506	41.91235506
1.041889066	5.908846318	170	1.42491432	0.97203596	-4.94810522	34.9832932	34.9832932
1.14483972	5.889763101	169	1.55244029	1.04668417	-4.84104684	31.8695668	31.8695668
1.247470145	5.86885604	168	1.677973428	1.12223743	-4.74640981	28.86604976	28.86604976
1.349700326	5.846220389	167	1.801286937	1.192585232	-4.653355157	24.57660661	24.57660661
1.451531374	5.821774538	166	1.922361735	1.260674541	-4.561099817	21.9009168	21.9009168
1.552914271	5.79534958	165	2.041862756	1.32572572	-4.469782386	20.40684094	20.40684094
1.653824135	5.767170176	164	2.159259204	1.38024023	-4.379309940	19.35688594	19.35688594
1.754202228	5.737828356	163	2.274796032	1.440231122	-4.289397414	18.42073926	18.42073926
1.854101966	5.706359098	162	2.388523565	1.505772149	-4.112147361	17.57767346	17.57767346
1.953408927	5.673111454	161	2.50048302	1.569640092	-4.024272612	16.81189317	16.81189317
2.05120086	5.638155725	160	2.610711684	1.613882113	-3.936886346	16.11112275	16.11112275
2.150207697	5.601482559	159	2.719241382	1.664396213	-3.849931471	15.46503889	15.46503889
2.24763056	5.563103127	158	2.826099913	1.713171566	-3.763397688	14.86771761	14.86771761
2.344386771	5.520209121	157	2.931311236	1.759669353	-3.677726537	14.31073278	14.31073278
2.44019858	5.48272746	156	3.034803818	1.804146209	-3.5931191278	13.79022555	13.79022555
2.53570957	5.447846722	155	3.136870949	1.846655444	-3.509317393	13.30115625	13.30115625
2.630228981	5.392764278	154	3.237251003	1.887246883	-3.42707191	12.84014592	12.84014592
2.723942998	5.340609145	153	3.336347849	1.925967235	-3.346832329	12.4013608	12.4013608
2.816829377	5.29183557	152	3.433270797	1.96280318	-3.268028183	11.99032287	11.99032287
2.908837721	5.247718243	151	3.527092116	1.997987303	-3.190747449	11.60228163	11.60228163
3	5.196152423	150	3.620220286	2.031326914	-3.114823508	10.83228633	10.83228633
3.092228449	5.140030804	149	3.715359215	2.062975621	-3.040208183	10.51970832	10.51970832
3.179515385	5.088288577	148	3.806340412	2.092947814	-2.967340763	10.2002479	10.2002479
3.26783421	5.032023408	147	3.893966137	2.121275964	-2.895071443	9.873062432	9.873062432
3.355157421	4.974225435	146	3.983833552	2.147190078	-2.823244656	9.547828551	9.547828551
3.442491266	4.91491266	145	4.076146631	2.17112137	-2.751740675	9.223444704	9.223444704
3.529711514	4.854101966	144	4.16880638	2.194695212	-2.680788104		
3.616800139	4.79181306	143	4.26080764	2.218738598			
3.699588352	4.728064522	142	4.319694984	2.235776418			

FIG. 28D

-29	-20.1187848	30.88312152	46.34644094	3.77922246	4.60287569	141	4.39733301	2.258330419	-2.4043435	8.989129229	3.4045431
-28	-19.4543137	30.5458683	45.75721779	3.85672638	4.59626659	140	4.478190132	2.27929274	-2.320337385	8.7141835	-2.320337385
-27	-18.78830438	30.32169562	45.7780481	3.96314174	4.578237481	139	4.5508137	2.29208863	-2.236108816	8.447983164	-2.236108816
-26	-18.11900413	29.88099387	44.6384993	4.014782038	4.458808953	138	4.630330292	2.306831367	-2.152037386	8.18970492	-2.152037386
-25	-17.44650311	29.5534589	44.0792882	4.07199016	4.38812231	137	4.703998663	2.320177518	-2.067944891	7.939634958	-2.067944891
-24	-16.7711282	29.2288718	43.46989819	4.167950223	4.316038802	136	4.776036178	2.331145698	-1.983893104	7.696322253	-1.983893104
-23	-16.09284059	28.90715691	42.9519469	4.26406087	4.24040087	135	4.846496973	2.34714986	-1.898885701	7.460219338	-1.898885701
-22	-15.41184847	28.58815153	42.41563674	4.316038802	4.167950223	134	4.91502966	2.359020025	-1.815927198	7.23031428	-1.815927198
-21	-14.72828216	28.27117184	41.88653372	4.38812231	4.09190016	133	4.982475402	2.35967077	-1.732025064	7.006377646	-1.732025064
-20	-14.04272922	27.95772078	41.36430421	4.458808953	4.014783638	132	5.048002204	2.35967077	-1.648179761	6.788387225	-1.648179761
-19	-13.35397213	27.64602787	40.84831523	4.528237481	3.956354174	131	5.111874521	2.371949883	-1.564040491	6.576096186	-1.564040491
-18	-12.66349092	27.33650908	40.33882295	4.59626659	4.60287569	130	5.17408347	2.376020318	-1.48070534	6.36884441	-1.48070534
-17	-11.97066377	27.02900673	39.83489127	4.66287569	3.77922246	129	5.234620177	2.378831218	-1.397091728	6.166593056	-1.397091728
-16	-11.27651469	26.72448531	39.33039063	4.728084522	3.693988852	128	5.293475817	2.380397468	-1.313571384	5.969122664	-1.313571384
-15	-10.58208861	26.41971139	38.84400679	4.79181306	3.610800159	127	5.350641647	2.380733842	-1.230156297	5.76229105	-1.230156297
-14	-9.882346361	26.11763444	38.3434785	4.854101966	3.52671134	126	5.406109039	2.379824856	-1.148266878	5.587737545	-1.148266878
-13	-9.18288247	25.81713175	37.87099326	4.914912565	3.353157421	125	5.459899315	2.377774703	-1.068839315	5.4043778	-1.068839315
-12	-8.481931716	25.51804828	37.39059792	4.974223408	3.26783421	124	5.51914773	2.374597483	-0.980449938	5.223202758	-0.980449938
-11	-7.779713468	25.22028653	36.91476643	5.030234408	3.179515583	123	5.56226718	2.37006703	-0.89776718	5.046888897	-0.89776718
-10	-7.076268382	24.92373142	36.4265728	5.08238877	3.090228449	122	5.610827482	2.36446704	-0.815048545	4.874293018	-0.815048545
-9	-6.37170839	24.62826916	35.93799717	5.14003804	3	121	5.657679455	2.357721079	-0.73250737	4.705341171	-0.73250737
-8	-5.66912848	24.33378715	35.50035358	5.190152423	2.908857721	120	5.706783805	2.349846978	-0.650157398	4.539885626	-0.650157398
-7	-4.96826161	24.04017384	35.04608815	5.247118243	2.816829377	119	5.746138003	2.340844978	-0.568012743	4.377804808	-0.568012743
-6	-4.252681398	23.7473186	34.58363013	5.297685557	2.723945988	118	5.787370838	2.330741512	-0.486087863	4.218982094	-0.486087863
-5	-3.544888363	23.4531164	34.12915381	5.34609145	2.630226881	117	5.827357438	2.319545462	-0.404397337	4.063304828	-0.404397337
-4	-2.836356162	23.16344384	33.6742391	5.397642478	2.53370957	116	5.865611791	2.307270059	-0.322594882	3.91066036	-0.322594882
-3	-2.127793324	22.8720668	33.2140281	5.481272746	2.44019858	115	5.901888562	2.295928526	-0.241781045	3.760950066	-0.241781045
-2	-1.418707911	22.58129209	32.77043319	5.523029121	2.344386771	114	5.936381607	2.279534091	-0.160885768	3.614058332	-0.160885768
-1	-0.709407641	22.29059236	32.32112259	5.563103127	2.24763956	113	5.969086991	2.264100006	-0.080286763	3.469881699	-0.080286763
0	0	22	31.87326697	5.563103127	2.24763956	112	6	2.24763956	0	3.328312088	0
1	0.709407641	21.70940764	31.42666559	5.601482539	2.190207697	111	6.029116657	2.230166095	0.079958398	3.189239686	0.079958398
2	1.418707911	21.41870791	30.98112062	5.638153725	2.05712086	110	6.056433436	2.21693015	0.159572155	3.052550572	0.159572155
3	2.127793324	21.12779332	30.53645881	5.673111454	1.953489872	109	6.081947772	2.192233804	0.238824877	2.918125625	0.238824877
4	2.836356162	20.83635616	30.09242115	5.706339098	1.854101966	108	6.106535573	2.171802035	0.317700069	2.785839603	0.317700069
5	3.544888363	20.54488836	29.64888232	5.737828336	1.754230228	107	6.127556236	2.150411382	0.396181154	2.655539594	0.396181154
6	4.252681398	20.2526814	29.20563146	5.767570176	1.65382135	106	6.14764745	2.128075633	0.474251498	2.527124143	0.474251498
7	4.959826161	19.95982616	28.76247979	5.795354958	1.552914271	105	6.1679598715	2.104808896	0.551894425	2.40038831	0.551894425
8	5.666212848	19.66621285	28.31924036	5.821774738	1.451531574	104	6.187398843	2.080524615	0.629093241	2.275158008	0.629093241
9	6.37170839	19.37170839	27.87572677	5.846220389	1.349706326	103	6.197037976	2.055337576	0.70583125	2.15123164	0.70583125
10	7.076268382	19.07626838	27.4373731	5.868885604	1.247470145	102	6.209006387	2.039561919	0.782091774	2.02067031	0.782091774
11	7.779713468	18.77971347	26.9871336	5.889763101	1.144839972	101	6.220945693	2.02712145	0.857838173	1.906281266	0.857838173
12	8.481931716	18.48193172	26.54168248	5.908645518	1.04188066	100	6.232601222	2.009502928	0.931113862	1.784634384	0.931113862
13	9.18288247	18.18288247	26.0921362	5.927330044	0.93866679	99	6.243707683	1.946449123	1.007842333	1.663008640	1.007842333
14	9.882346361	17.88234636	25.6475403	5.941684112	0.835038606	98	6.247048653	1.917063774	1.08027168	1.548977564	1.08027168
15	10.58208861	17.58208861	25.19847501	5.95327691	0.73121605	97	6.24973234	1.886888122	1.154652062	1.417556117	1.154652062
16	11.27651469	17.27651469	24.74782913	5.967131372	0.62717078	96	6.24973234	1.853871619	1.228700809	1.292122277	1.228700809
17	11.97066377	16.97066377	24.2941269	5.977168189	0.52294456	95	6.24973234	1.82409193	1.30157473	1.16372704	1.30157473
18	12.66349092	16.66349092	23.84103419	5.983384002	0.418538842	94	6.24973234	1.791544948	1.372006103	1.029059013	1.372006103
19	13.35397213	16.35397213	23.38450027	5.99177209	0.314015737	93	6.24973234	1.758246799	1.442321062	0.886300791	1.442321062
20	14.04272922	16.04272922	22.92561551	5.996344962	0.20939698	92	6.24973234	1.724213854	1.514818873	0.72913145	1.514818873
21	14.72828216	15.72828216	22.46418219	5.999086171	0.104714439	91	6.24973234	1.689467335	1.584748206	0.5441416	1.584748206
22	15.41184847	15.41184847	22	6	3.67545E-16	90	6.223803512	1.654010328	1.654010328	0.27878415	1.654010328

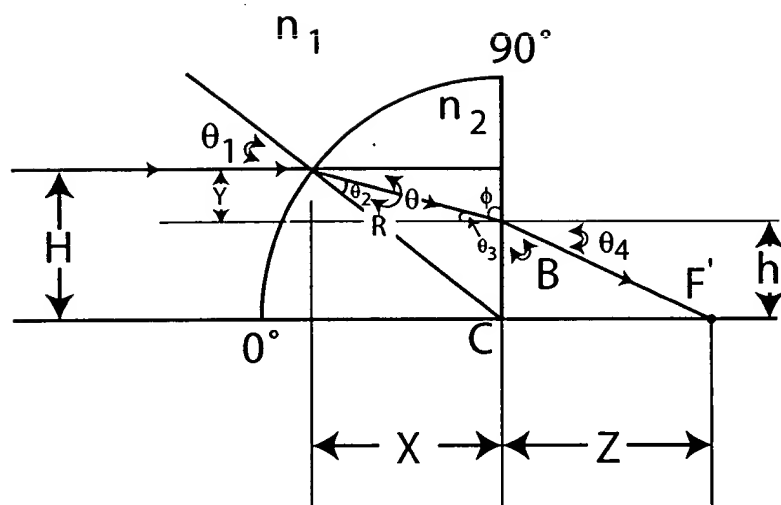


FIG. 29

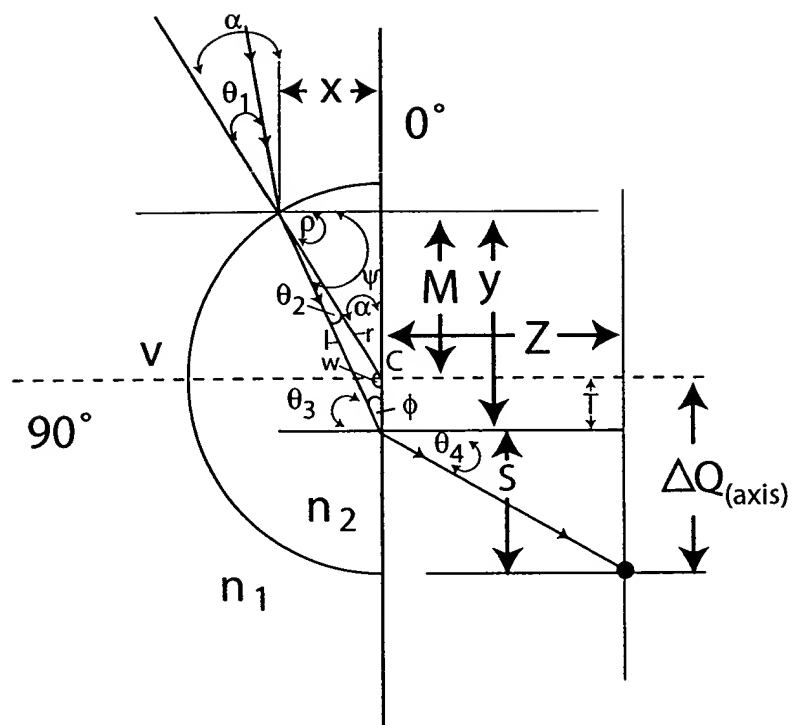


FIG. 30

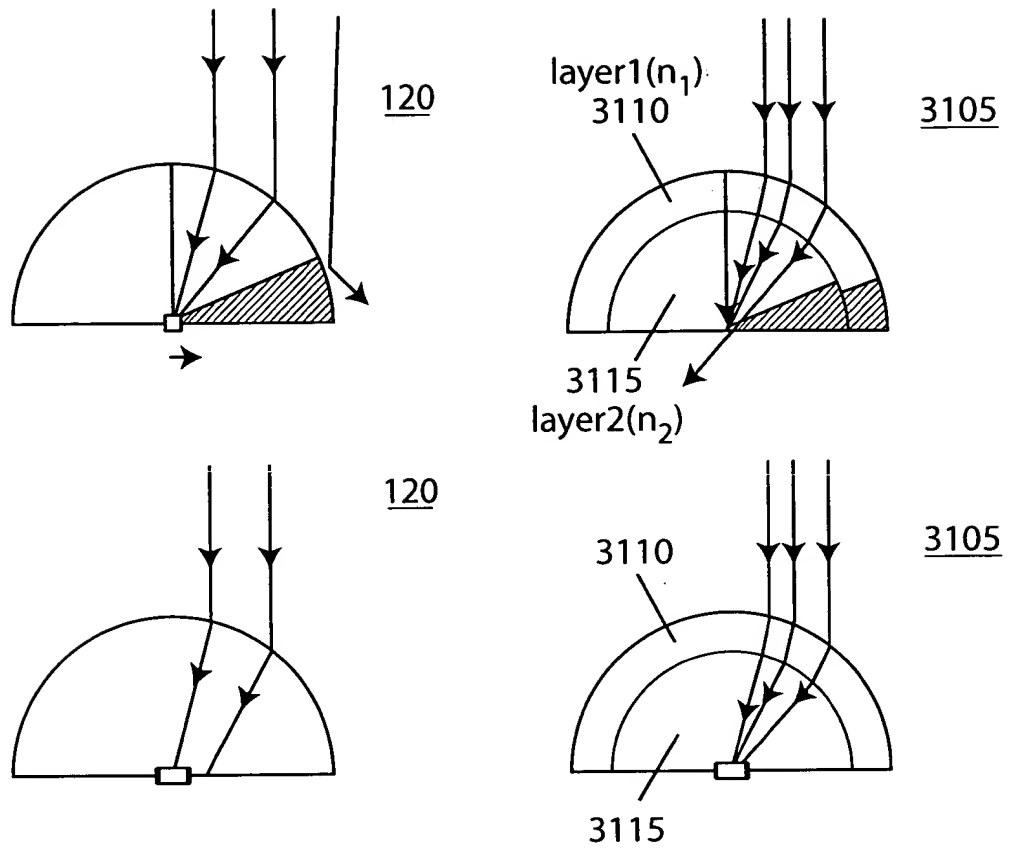


FIG. 31

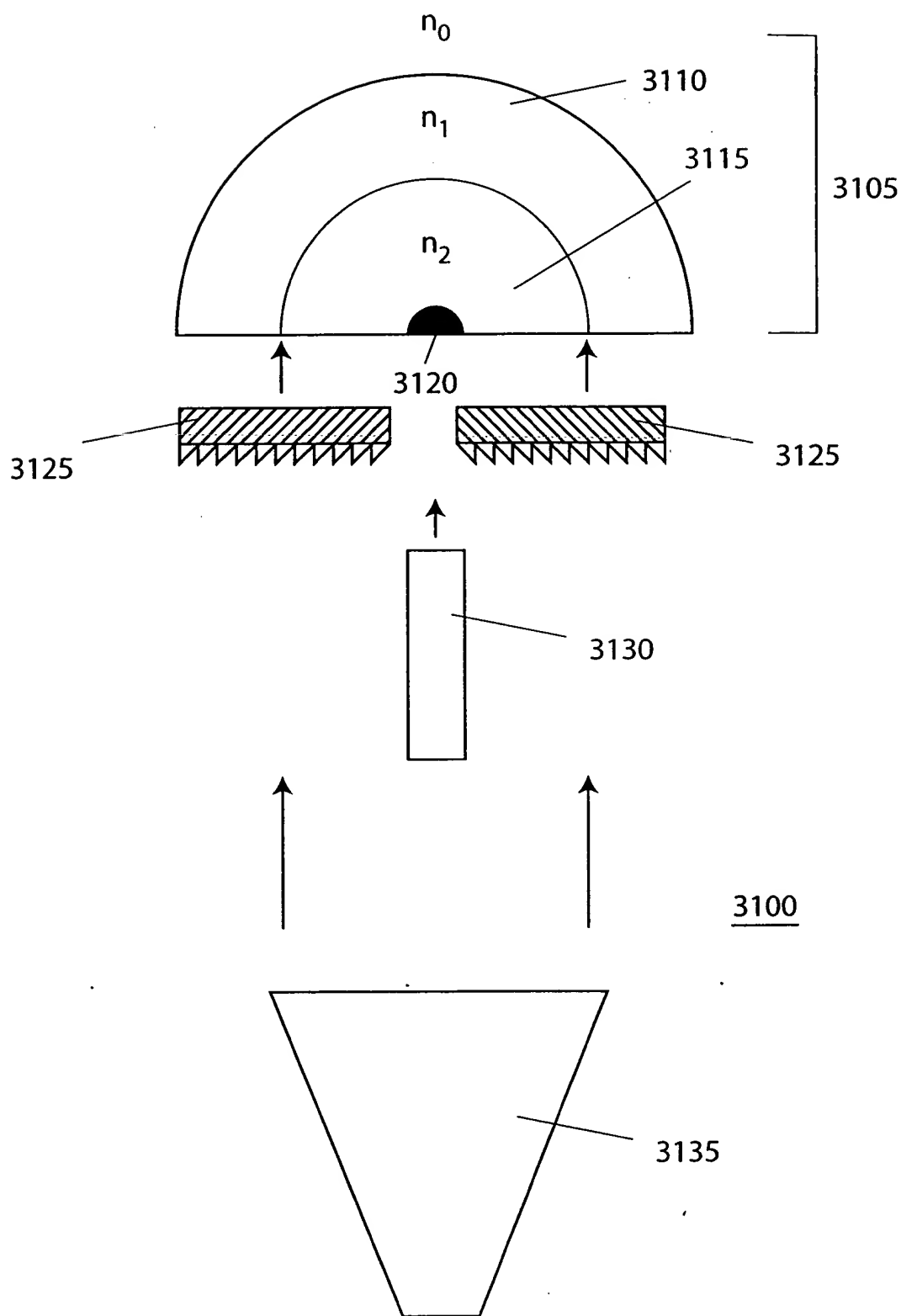


FIG. 32A

FIG. 32B

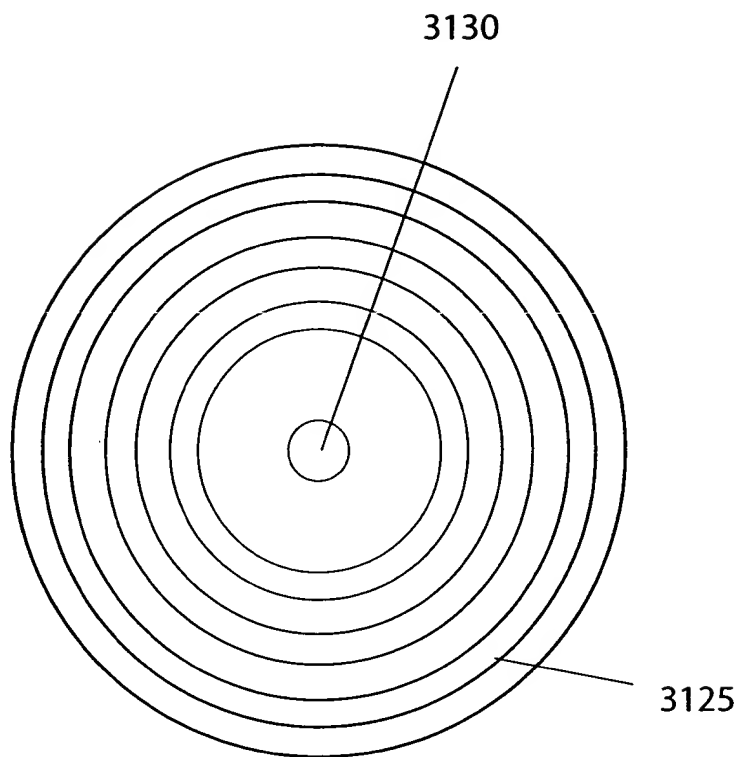


FIG. 32B

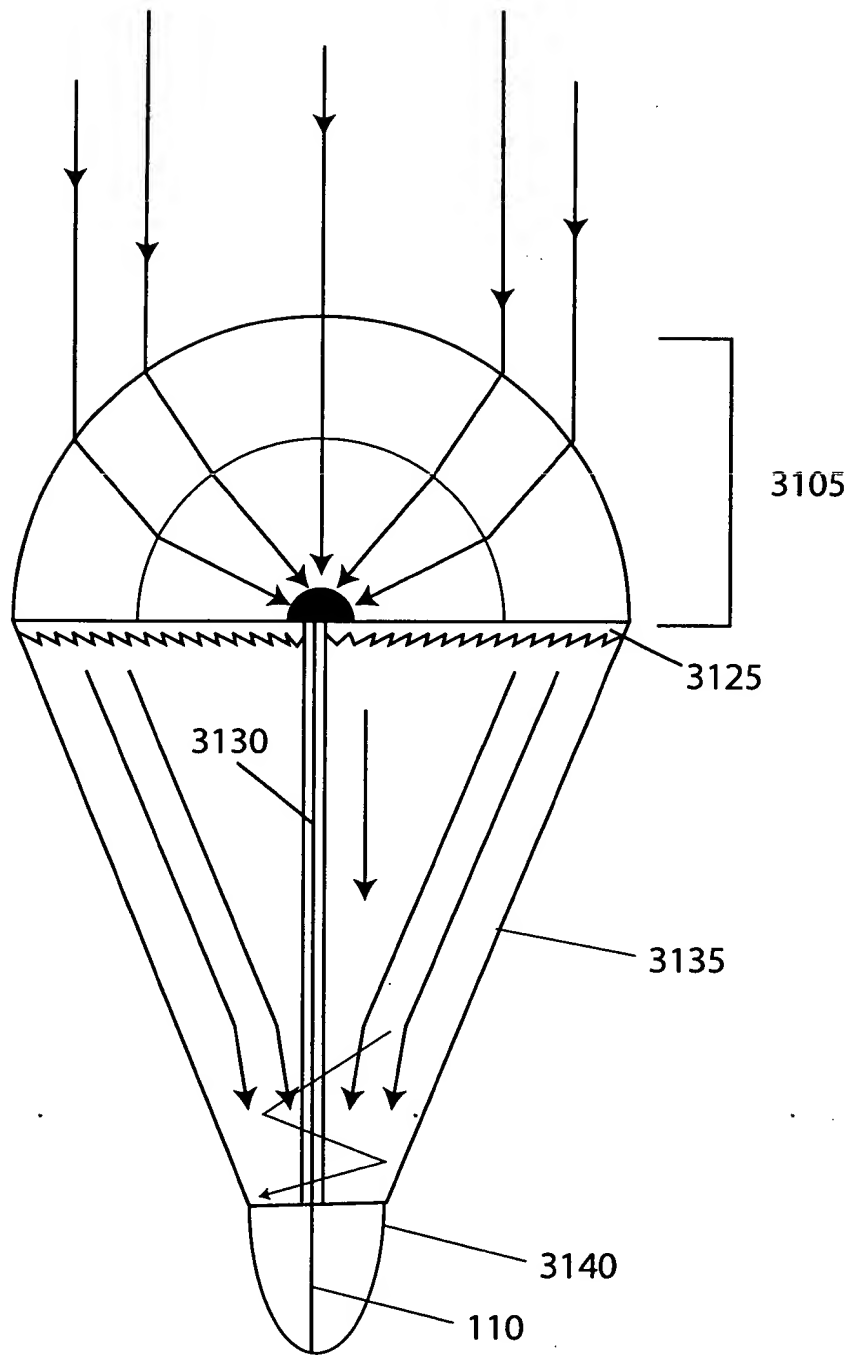


FIG. 32C

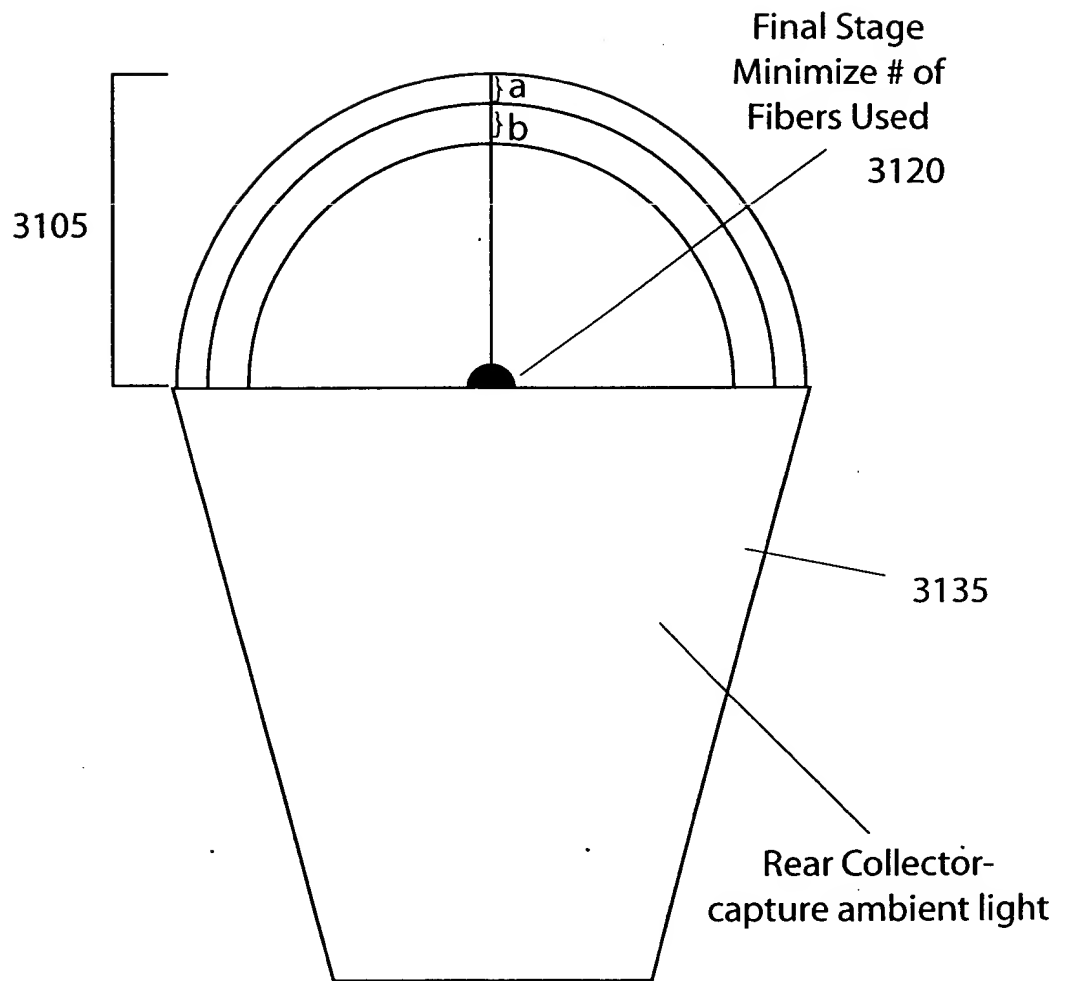


FIG. 32D

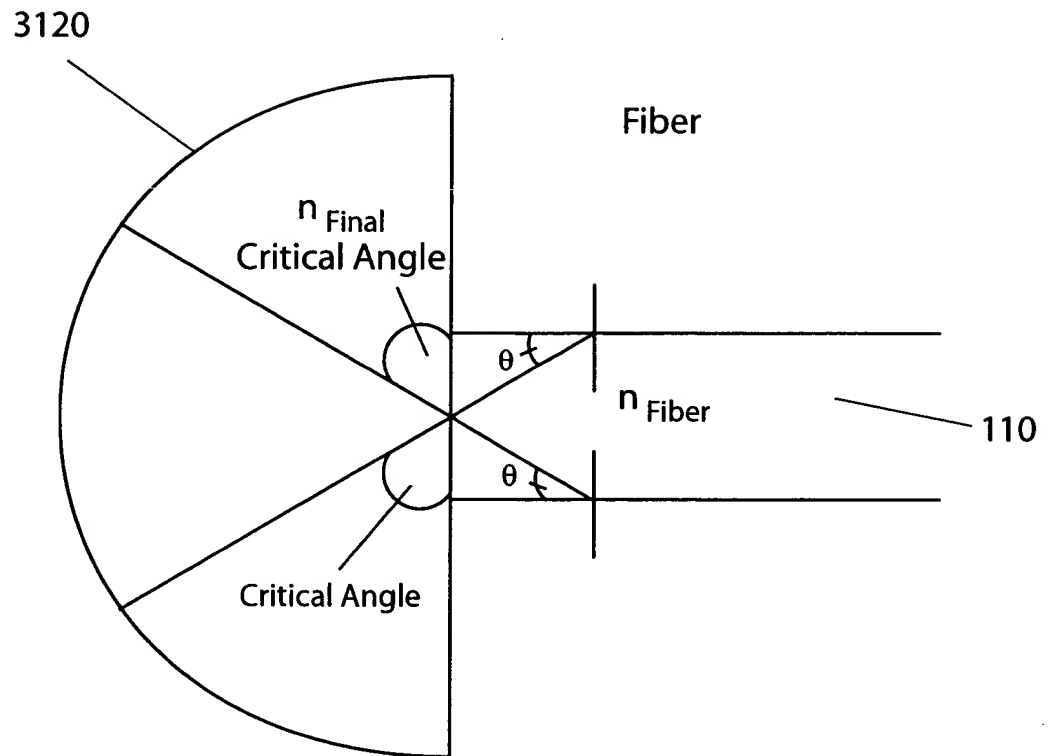


FIG. 33A

3120

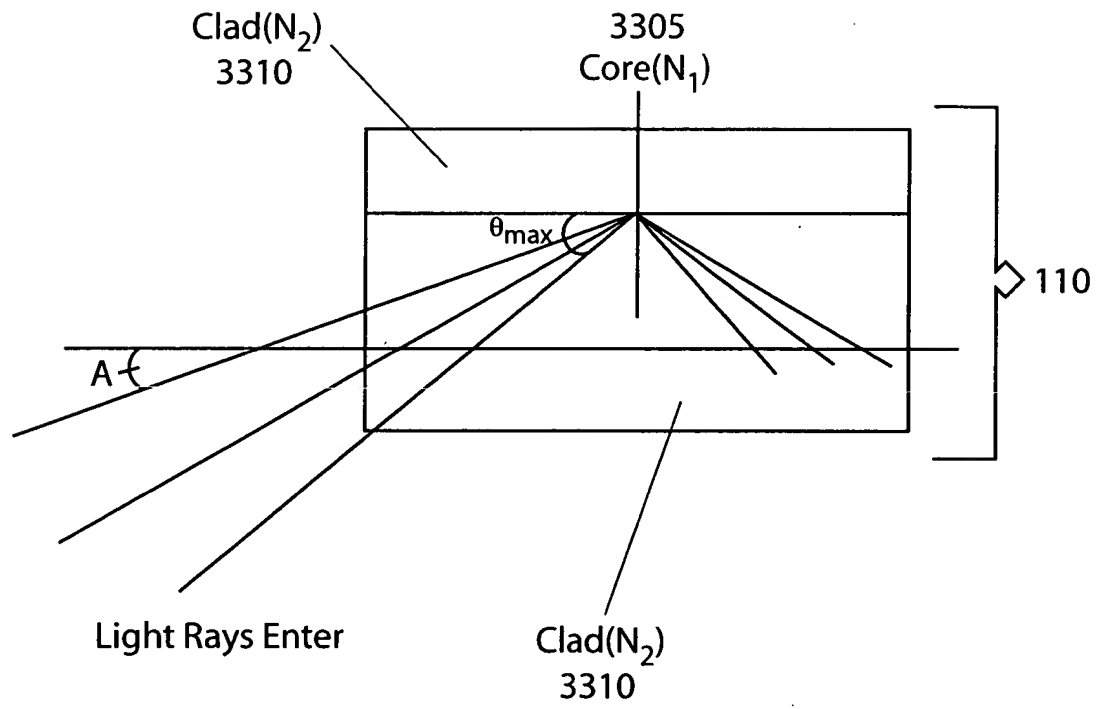
Max Angle of Entry From Final Stage Critical

Refraction @Medium Crossover

θ

110

FIG. 33B



$$NA = \sqrt{(N_1)^2 - (N_2)^2}$$

FIG. 33C

3400

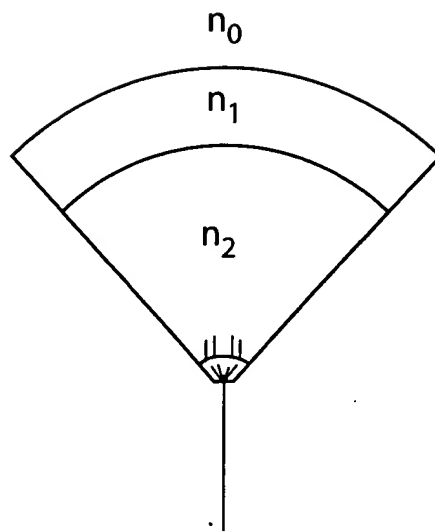


FIG. 34A

FIG. 34B

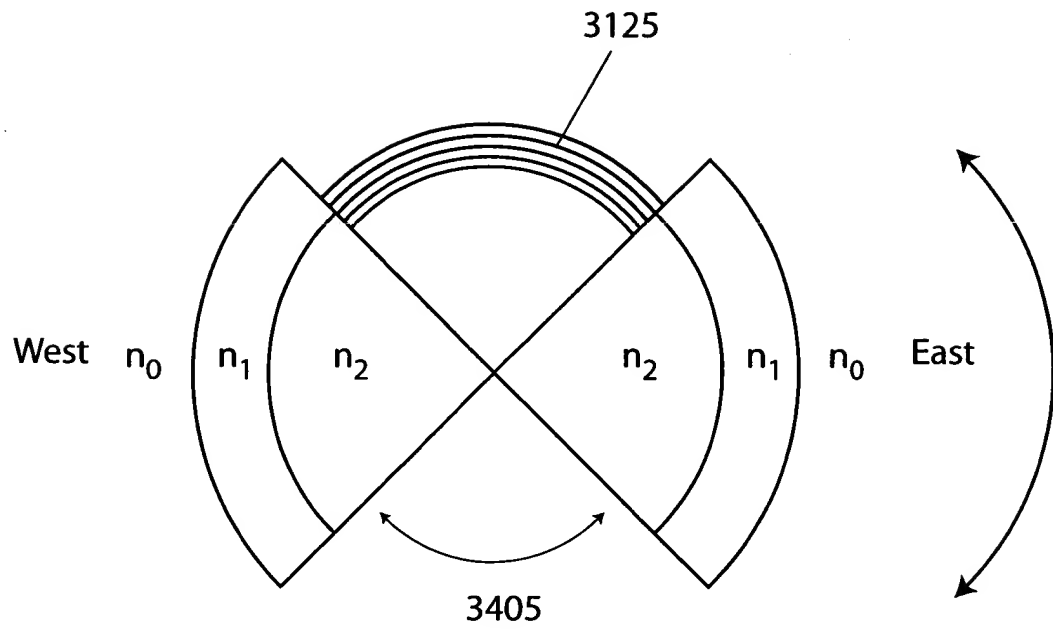


FIG. 34C